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OFFICIAL ORGAN OF THE NORTHWEST FRUIT GROWERS ASSOCIATION

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# BETTER FRUIT

*June 1909—Peach Edition*

PUBLISHED BY BETTER FRUIT PUBLISHING COMPANY, HOOD RIVER, OREGON

THE NEW SIMS CLING PEACH
NATURAL SIZE

# *These Apples grew in the*
## WHITE SALMON VALLEY

*Opposite Hood River*

Soil, climate & location especially adapted for high grade fruit & berries. *Send* for our *Book* descriptive of this beautiful valley

PARTLY IMPROVED

No. 181. Forty acres seven miles northeast of the town of White Salmon and five miles from the Columbia River. This tract has a very desirable slope and is first-class fruit land, having a deep, rich, red shot soil. Four acres are planted to Spitzenberg and Yellow Newtown trees one year old, with strawberries and other small fruits for family use. Eleven acres are cleared and ready for use, and also four acres in timothy and clover, with plenty of water for irrigation. Remainder of tract is the best orchard land. Small house and outbuildings. Has an abundance of pure spring water. The possibilities of this tract for a commercial orchard and for a home are hard to surpass. Write for prices and terms. This tract can be had at a bargain.

**White Salmon Land Co.**

VAN VORST & WELLS, Managers, Successors to J. C. McInnes

WHITE SALMON, WASHINGTON

# WATER IS KING

## IRRIGATED ORCHARDS

Are the only solution of the problem of INCOME during the five years necessary for the growth of the trees to the bearing age. This is a VITAL FACT which every homeseeker should take into consideration. By planting potatoes, tomatoes, berries and vegetables between the trees where irrigation is used, as high as $200 per acre has been taken off annually. In many cases the orchards pay for themselves, when irrigation is used, BEFORE they come into bearing, in addition to furnishing a living for the owner and family. Would you gamble on the elements in any other line of business? Don't take chances, then, in orcharding. Irrigation is insurance for a regular and heavy crop. If you have any idea of coming West; if you are tired of the uncertainty of farming there; if you are on a salary and want to better your condition; if, for any reason, you are interested in fruit growing, *you will be vitally interested* in the propostion of the Sutherlin Land & Water Company, which owns the wonderful Sutherlin Valley in Douglas County, Oregon. Don't fail to write today for a beautiful booklet (free) telling much of importance to you. It may mean an immense saving of labor and time to you and a competency that would otherwise be impossible.

Address

**The Sutherlin Land & Water Co.**

Head Offices: ROSEBURG, OREGON

JONATHANS NEWTOWNS

Prunes Peaches Pears Plums Apples

# THE LAND OF OPPORTUNITY

*A three-year-old Spitzenberg apple tree at White Salmon*

Located across the Columbia River from Hood River, Oregon, the White Salmon Valley offers the greatest opportunities of any land on earth to fruit growers. Where apples, cherries, pears, peaches, prunes and strawberries grow to perfection. A few dollars invested in fruit land today will return to you in a very few years sixty-fold. The soil, climate, water and scenery are unsurpassed by that of any country. Build a home where you can enjoy peace and plenty the remainder of your life. Fruit lands cleared, planted and cared for until in a bearing condition. Write us for descriptive matter and prices.

**Estes Realty & Investment Co.**

WHITE SALMON, WASHINGTON

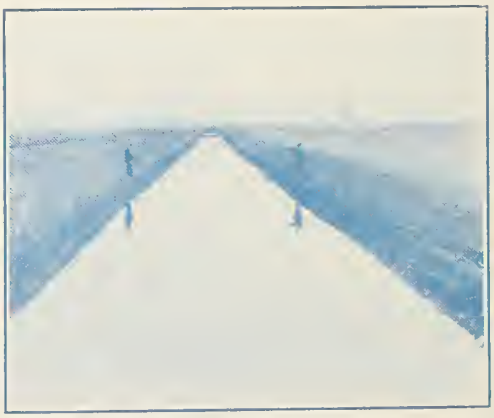
Berries Cherries Strawberries Nuts

SPITZENBERGS WINESAPS

# WINTER APPLES

WILL MAKE A MAN RICH ON TEN ACRES OF

## SPOKANE VALLEY LAND



SPOKANE RIVER CANAL

under the largest and best constructed Irrigation Canal in Eastern Washington. Close to a city of 120,000 people. Electric and Steam Railroads at your door. Fine climate; beautiful roads. A pleasant place to live.

*WRITE FOR INFORMATION. IT IS FREE*

**Becher & Thompson**

*110 Stevens Street* *SPOKANE, WASH*

# Steinhardt & Kelly

101 Park Place, New York

*The largest and most extensive fruit concern in the world operating in all the fruit growing sections of the civilized globe*

# Exclusive Purveyors of High Class Fruits

STEINHARDT & KELLY HANDLE MORE

## BOX APPLES

THAN ANY OTHER CONCERN IN THE COUNTRY

and was the first fruit house to extensively introduce the Northwestern product to the consumers of the East. With able representation in all the leading markets STEINHARDT & KELLY are enabled to handle the entire crops of the most extensive districts with utmost ease and celerity

CORRESPONDENCE WITH ASSOCIATIONS, UNIONS AND INDIVIDUAL GROWERS WILL BE GIVEN PERSONAL ATTENTION

# THE DALLES, OREGON

"The Cherry City"

BEAUTIFULLY located on the Scenic Columbia River just east of the Cascade Range of Mountains, where apples, pears, peaches, cherries and apricots are grown to perfection without irrigation. Choice fruit land in small tracts offered at $50 to $150 per acre on easy terms. *Address*

THE DALLES BUSINESS MEN'S ASSOCIATION

## HUDSON LAND CO.

The Dalles, Oregon

**Fruit, Wheat and Stock Farms**

For sale in Eastern Oregon and Washington. Acre tracts in any quantity desired, with or without trees planted, within one mile of city. We are sole agents for the sale of five and ten-acre tracts in Peachland Park, which we can sell you on easy installments and care for the orchard until it is in full bearing. This is a beautiful tract of land situate one mile west and overlooking the city. The soil is a rich, deep, sandy loam, and is set out on the most approved methods to peaches and cherries. Some of the trees are three years old. Write to us for full particulars.

# I DON'T WANT TO SELL TEN ACRES

Three of us bought forty acres at Underwood, opposite Hood River, one and one-half miles from depot, from a man who does not live here. We got the forty acres as a whole at a bargain. Each of us wants to keep ten acres. I want to sell the odd ten acres so as to set my ten acres adjoining, which will make me a home and a profitable business. Therefore I am willing to sell this ten acres at a bargain and am only asking $100 per acre, although adjoining land cannot be bought for less than $150 and up, per acre.

C. R. GREISEN, HOOD RIVER, OREGON

# HOOD RIVER

GROWS THE BEST APPLES IN THE WIDE WORLD

Hood River holds the high price record for nine years on Spitzenbergs and Newtowns.

Hood River apple pack is the only pack selling on the English market without the box being opened.

Hood River apples and pack are guaranteed. The seal of quality.

Hood River is the only fruit section in the world with a University Club. Over 100 members are fruit growers.

Hood River scenery is the grandest in the Northwest.

Hood River is healthy. Its water pure. Climate ideal.

Hood River people have health, wealth and happiness.

Hood River orchardists are clearing from $300 to $1,000 per acre.

Hood River Valley, its apples and people, are a class by themselves.

Hood River is just beginning to develop and set the upper valley to orchards. It is the best deep volcanic ash soil. I sold my place in the lower valley and bought in the upper valley because I could get more land for less money. I have 160 acres set to orchard not for sale. I have 160 acres ready to set. Price, $250 per acre. I will subdivide in 10, 20 and 40-acre tracts. This land in the lower valley would sell for $1,000 per acre. I have a few choice 10, 20 and 40-acre tracts, uncleared, at from $50 to $150 per acre. *Write for further particulars, or call on*

G. D. WOODWORTH, HOOD RIVER, OREGON

# LAND

OF BIG, RED APPLES

WE ALWAYS HAVE SOME
CHOICE TRACTS TO OFFER

At popular prices and sell them strictly on their merits. Years of study given to Hood River and its products. Can sell you intelligently. Call on or address

Geo. D. Culbertson & Co.

*Leading Land Agents Hood River, Oregon*

THE HOOD RIVER LAND EMPORIUM

HOOD RIVER, OREGON

*POSSESSES*

CLIMATE—A desirable medium between the drier eastern and the more moist western conditions of the Northwest.

SOIL—Volcanic ash, rich in phosphates, and recognized as the best in the world for apples and strawberries.

Makes a specialty of real estate, conveyancing, loans and surveying. The president, John Leland Henderson, is a practicing lawyer residing in Hood River, and has been identified with the Hood River Valley for thirty years.

# LAND

Apples, Peaches, Cherries and Apricots are moneymakers. Why not buy land where they grow to perfection. I have some bargains

Roe A. Deal, Springville, Utah

**Upper Hood River Valley**

Cheap and the best of land. Plenty of water for irrigation at low rates. Good transportation facilities. You are cordially invited to see what I have done at my home in six years. I handle these lands.

W. H. MARSHALL

Dee, Oregon In Hood River Valley

Underwood *and* Little White Salmon

*Choice Fruit Land for Sale*

I have a number of choice places for sale, improved and unimproved. Some with good heavy timber, ranging in price from $18.00 to $100.00 per acre. I make a specialty of small tracts

F. W. DEHART

UNDERWOOD, WASHINGTON

*Live facts in a lively way. Live facts for men and women. Facts that affect you—your family*

Hood River Valley

APPLE LANDS

Are paying from $400 to $700 an acre to their owners. Many started in a small way, today they are independent. You can begin today. It pays to see us

*He who investigates for himself becomes "the man who knows"*

W. J. BAKER & CO.

Hood River, Oregon

English Walnuts

*AND*

Royal Ann Cherries

We are the largest owners and planters of walnuts in Oregon. Our properties are in Yamhill County, the Walnut County. We sell planted five acre tracts $100 cash and $15 per month with four years' care

**The Churchill-Matthews Co.**

*Incorporated*

Lumber Exchange Building, Portland, Oregon

HOOD RIVER APPLE LAND

*For Sale on Easy Terms*

| | |
|---|---|
| 10 acres, uncleared, per acre | $125 |
| 20 acres, complete place | $20,000 |
| 24 acres, 500 trees | $5000 |
| 40 acres, 7 acres in trees | $5000 |
| 40 acres, uncleared | $1600 |
| 80 acres, uncleared | $2000 |
| 148 acres, partly cleared | $5000 |
| 62 acres, 800 trees | $10,220 |

**J. Adrian Epping, Hood River, Oregon**

E. YOCKEY A. M. BEAVER

YOCKEY & BEAVER

REAL ESTATE, INSURANCE AND LOANS
ORCHARD LANDS A SPECIALTY
CITY HOMES, BUSINESS PROPOSITIONS, ETC.

**"Ashland the Beautiful"**

Is noted as the health metropolis of Southern Oregon, possessing the purest mountain air and water in the world, besides containing medicinal springs of high quality. It is also noted for luscious fruit of all kinds, and as being the producer of the famous Newtown Pippin and Spitzenberg apples, the best in the world. Fine orchard land for sale at living prices, ranging from $55 to $250 per acre for the raw land, according to location, etc. Developed orchards higher. Correspondence solicited.

YOCKEY & BEAVER, Ashland, Oregon

# MOSIER

*Also called East Hood River*

FRUIT LANDS

In large or small tracts. Some very good land at low prices at present. Good growing community. Six miles east of Hood River. Parties wishing to buy will do well to write or see

GEO. CHAMBERLAIN

MOSIER, OREGON

THE BEAUTIFUL

*White Salmon Valley*

Land for Strawberries
Land for Orchards
Land for Dairying
Land for Stock Raising

For Sale By

*Egan Hair Real Estate Co.*

WHITE SALMON, WASHINGTON

# White Salmon Valley Land

I HAVE 120 acres of fine apple and strawberry land one and one-half miles from town of White Salmon that will cut to advantage in five, ten and twenty acre tracts. This tract is well located, with fine view of surrounding valley and in plain view of beautiful snow-capped Mt. Hood. Will sell all or part. Also other tracts.

F. L. GORDON WHITE SALMON, WASHINGTON

Richey & Gilbert Co.
H. M. Gilbert, *President and Manager*
Growers and Shippers of
YAKIMA VALLEY
FRUITS and PRODUCE
Specialties: Apples, Peaches, Pears and Cantaloupes
TOPPENISH, WASHINGTON

CORRESPONDENCE SOLICITED
RYAN & NEWTON CO.
Wholesale Fruit and Produce
BUTTE, MONTANA
We have modern cold storage facilities essential for handling your products. A strong house that gives reliable market reports and prompt cash returns

H. WOODS CO.
WHOLESALE FRUITS
and
COMMISSION
Apples, Peaches and Strawberries
127 South Water Street
CHICAGO, ILLINOIS

PORTLAND
BROKERAGE CO.
*Consignments solicited with quick returns*
FRUITS, PRODUCE
BUTTER AND EGGS
Telephone A 5758
206 Stark St., Portland, Oregon
Between Front and First Streets

FAMOUS HOOD RIVER
Strawberries
THE FINEST BERRY ON EARTH AND THE BEST SHIPPER
LOOK GOOD, BUT TASTE BETTER
*Fancy Pack Guaranteed*
FRUIT GROWERS UNION
Hood River, Oregon

Mark Levy & Co.
COMMISSION MERCHANTS
WHOLESALE FRUITS
121-123 FRONT AND 200 WASHINGTON ST.
PORTLAND, OREGON

Levy & Spiegl
WHOLESALE
FRUITS & PRODUCE
*Commission Merchants*
SOLICIT YOUR CONSIGNMENTS
*Top Prices and Prompt Returns*
PORTLAND, OREGON

FAMOUS HOOD RIVER
APPLES
Spitzenbergs, Newtowns,
Jonathans, Arkansas Blacks, Ortleys, Winesaps, R. C. Pippins, Baldwins, M. B. Twigs, Ben Davis
*Look Good, Taste Better, Sell Best*
GRADE AND PACK GUARANTEED
Apple Growers Union
Hood River, Oregon

THE OLD RELIABLE
BELL & CO.
Incorporated
WHOLESALE
FRUITS AND PRODUCE
109-115 FRONT STREET
PORTLAND, OREGON

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Wholesale Fruits and Commission
STRAWBERRIES AND APPLES OUR SPECIALTY
A Strong House, Pioneer Dealer of Thirty Years' Experience
OMAHA, NEBRASKA

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Depository, National Bank of Commerce
Capital Stock, $25,000.
Wholesale Fruits, Vegetables and Produce
Berries in Car Lots
Our Motto, "Quick Sales and Daily Reports"
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IF YOU WANT TO MARKET YOUR
FRUIT
RIGHT, ALWAYS SHIP TO
W. B. Glafke Co.
WHOLESALE FRUITS AND PRODUCE
108-110 Front Street
PORTLAND, OREGON

W. H. Dryer W. W. Bollam
Dryer, Bollam & Co.
General Commission Merchants
128 FRONT STREET
PORTLAND, OREGON
TELEPHONE MAIN 2348

**Pearson-Page Co.**

131-133 FRONT STREET
PORTLAND, OREGON

Superior facilities for handling

**PEACHES APPLES AND PEARS**

Solicit Your Consignments

*Reliable Market Reports* *Prompt Cash Returns*

*THE*

**DAVIDSON FRUIT CO.**

*of*

Hood River, Oregon

Pioneer fruit packers and shippers of this famous section. "Quality" is our watchword, and "Fruit Worth the Price" is our motto. Wire or write us for apples, strawberries or pears in season in car lots or smaller shipments. Other fruits in season in less quantities.

**Ryan & Newton Company**

Wholesale Fruits & Produce

Spokane, Wash.

We have modern cold storage facilities essential for the handling of your products. Reliable market reports

PROMPT CASH RETURNS

**YAKIMA COUNTY HORTICULTURAL UNION**

NORTH YAKIMA, WASH.

*E. E. Samson, Manager*

APPLES, PEARS, PRUNES, PLUMS, PEACHES, CHERRIES, APRICOTS, GRAPES AND CANTALOUPES

Mixed carloads start about July 20. Straight carloads in season. Our fruit is the very best grade, and pack guaranteed.

*We Use Revised Economy Code*

**Apple Storage**

ST. LOUIS is the best local market and distributing point to ship your apples, and hold on cold storage, for highest winter prices.

OREGON, WASHINGTON & IDAHO *Fruit Associations, Growers & Shippers*

I solicit your carload shipments of box apples this fall for cold storage here. Will advance freights and pay insurance, charging usual commission and interest.

Storage rates 15 cents per box for season ending May 1.

Only Extra Fancy Fruit wanted.

I do business with the Mound City Ice and Cold Storage Company, the largest and most modern apple storage house in the middle West. Cars unloaded direct into coolers.

**F. S. Timberlake**

*3019 North Broadway Street*
*St. Louis, Mo.*

Bank and other References

**LINDSAY & CO. LTD.**

Wholesale Fruits

HELENA, MONTANA

*Established in Helena Quarter of a Century*

Branch houses: Great Falls, Montana; Missoula, Montana; Billings, Montana.

**Fruit Facts**

Chelan County won 35 gold medals on fruit exhibits at the Portland Exposition, 1905. This record was not equaled by any other county on the Pacific Coast. We will have 75 to 100 cars of apples: Winesaps, Spitzenberg, Rome Beauties, Lawvers, Jonathans, etc., all packed under the supervision of this association. Correspondence solicited.

**Wenatchee Valley Fruit Growers' Association**

WENATCHEE, WASHINGTON

M. O. TIBBETTS, *President* E. T. BALCH, *Secretary*

**DAVENPORT BROS.**

WHOLESALE FRUIT & PRODUCE

Growers and Shippers of the Famous

**Mosier Valley Fruits**

Portland, Oregon

**D. CROSSLEY & SONS**

*Established 1878*

**APPLES FOR EXPORT**

California, Oregon, Washington, Idaho and Florida fruits. Apples handled in all European Markets. *Checks mailed from our New York office same day apples are sold on the other side.* We are not agents; we *sell* apples We make a specialty of handling Cherries, Apricots, Peaches and all early fruits on the New York market. *Correspondence solicited*

200 TO 204 FRANKLIN STREET, NEW YORK

LIVERPOOL NEW YORK BOSTON GLASGOW

# MOSIER

THE NATURAL HOME OF SPITZENBERG AND NEWTOWN APPLES

APPLE LAND—GOOD, BETTER, BEST—AT PRICES LOWER THAN LESS VALUABLE LAND IN OTHER LOCALITIES

Scenery, climate, water and general conditions unsurpassed for residence, and for the raising of all kinds of fruit. MOSIER is a Siamese twin to Hood River (six miles east) in the fruit industry

MOSIER APPLES AT HOOD RIVER FAIR

*Further information gladly given by*

**Commercial Club of Mosier Valley** **Mosier, Oregon**

# White Salmon Valley

WASHINGTON

Across the river from Hood River Valley, Oregon, in the Banner Apple Belt of the World

The WHITE SALMON VALLEY today presents OPPORTUNITIES FOR INVESTMENT beyond that of any other FRUIT REGION in the Northwest. It is the north half of a LARGE VALLEY lying between Mount Adams on the north and Mount Hood on the south. The mighty Columbia flows between and divides this valley. From the Columbia River to Mount Hood forms the Hood River Valley, and from the Columbia River to Mount Adams forms the White Salmon Valley. Both these mountains are snowclad all the year and influence the climatic conditions. This, together with a volcanic ash soil, produces apples that are superior to all others in the world in FLAVOR, SIZE, COLOR, and, most important of all, KEEPING AND SHIPPING QUALITIES.

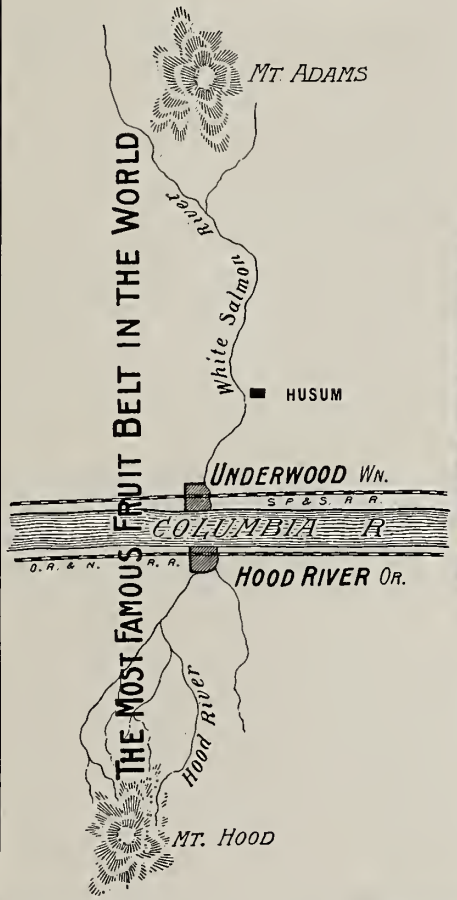
Ninety per cent of the fruit grown in this valley is exported, bringing the highest market prices.

THE CLIMATE of this region is ideal. It is located in the midst of the CASCADES, with a pure mountain air and free from excessive rains or drouth. The snow-covered peaks at either end of the valley temper the heat of summer and make the summer nights cool and invigorating. The winters are as a rule mild and short. The scenery is as fine as may be found anywhere on the continent.

The valley has been held back heretofore through lack of railroad transportation, but the SPOKANE, PORTLAND & SEATTLE RAILROAD, part of the Hill system, now in operation, gives this valley the best of shipping facilities.

NOW IS THE TIME TO SECURE A CHOICE ORCHARD TRACT AT A LOW FIGURE. Write today for particulars of this wonderful valley to the

WHITE SALMON VALLEY DEVELOPMENT LEAGUE, WHITE SALMON, WASHINGTON




# UNDERWOOD

*The Gateway to the White Salmon Valley*

WHITE SALMON VALLEY FRUIT GROWERS' UNION OF UNDERWOOD, WASHINGTON, Won three important premiums at Spokane—First on Best Four-Tier Newtowns, Second on Best Ten Boxes Newtowns, First on Best Pack.

Twenty minutes from Hood River by ferry. Two hours by rail, seven hours by boat from Portland. Twenty-five thousand acres first-class fruit land tributary to this point. Has a strong Apple Growers' Union, which controls output of the valley. Same fruit, same markets, same prices as Hood River has. Fine class of people coming in—a community of *homes*. Land close in to river and railroad, $40.00 to $150.00 an acre *now*, but advancing rapidly.

Write, phone or call on

**W. F. CASH** UNDERWOOD WASHINGTON

Come to **UNDERWOOD and HUSUM**

## FOR WHITE SALMON VALLEY ORCHARD LANDS

These two districts comprise the major part of the White Salmon Valley, which, separated from Hood River Valley by the Columbia River (a scant 1¼ miles), is just beginning to feel the effects of the great rush of Eastern people to these favored spots along the Columbia River. We have a territory greater than Hood River, while all our conditions are identical with that famous spot. We have a strong Apple Growers' Union, composed of wide-awake business men. At the National Apple Show we won first on best four-tier and second on best ten boxes of Newtowns, and first on best commercial pack.

Underwood, at the mouth of the White Salmon River, is twenty minutes by ferry from Hood River, and two hours by rail or seven hours by boat from Portland. All trains on the North Bank stop here, and the survey of a branch road to run up the valley to Husum has just been completed. Husum is six miles up the river, at the falls in the river and the forks of the Trout Lake and Camas Prairie roads. It has a hotel, store, post office, blacksmith shop, school, and an electric light plant intended to supply current to the people of the valley. This is destined to become a busy little town, as it is in the heart of the best orchard land of the valley. Good lands are comparatively cheap as yet. Full information from SECRETARY OF IMPROVEMENT CLUB, Underwood, Washington

# BARGAINS IN HOOD RIVER APPLE LAND

508. 7 acres 7 miles out on East Side; 4 acres bearing orchard, 12-year-old Spitzenbergs and Newtowns, a few odd varieties; creek runs through place; 4-room house, small barn. Price $5,000. Easy terms.

533. 10 acres 7 miles out on East Side; ¼ mile to railway, near school, church and store; all good apple land; 4 acres 1-year-old Spitzenbergs, Newtowns and Ortleys; balance of land in clover. Price $3,700. Easy terms.

538. 10 acres 3 miles out on West Side; all in trees; 1-year-old Spitzenbergs, Newtowns and Ortleys; 35,000 strawberry plants; 7½ inches water stock; all fenced with woven wire fencing. Price $7,500. Easy terms.

3A5. 20 acres 6 miles out on West Side, all unimproved; about 3 acres steep; all timbered. Price $125 per acre. Easy terms.

509. 20 acres 5 miles out on West Side; 800 4-year-old Spitzenbergs and Newtowns, 75 1-year-old Spitzenbergs and Newtowns, 50 4-year-old cherries, 30 10-year-old assorted trees; 7-room house, small barn, good well; team, harness, wagon, all farm equipment. Price $11,500. Easy terms.

2K2. 20 acres 6½ miles out on East Side; 17 acres 5 and 6-year-old Spitzenbergs, Newtowns and Jonathans; 3 acres hay; good 6-room house, barn and other outbuildings; 6 inches water stock; all good apple land, on main traveled road and in fine neighborhood. One of the best places in the valley. Price $20,000. Terms.

544. 20 acres 3 miles out on West Side; 17 acres planted to trees, mostly in bearing Spitzenbergs, Newtowns, Baldwins, Kings, Delicious, peaches, pears, etc.; ½ acre strawberries, 1 acre potatoes, all kinds of garden truck; a good 10-room house with water piped through it, also piped to barn and flower garden; a cold storage building of stone, 14x18; all outbuildings; 80 rods to church, 1 mile to school and store; under two irrigating ditches. Price $18,000. Easy terms.

549. 10 acres; 6½ acres in trees 2 years old, Spitzenbergs, Newtowns, Arkansas Blacks and Ortleys; 200 Comice pear fillers, 60 peaches, Lambert and Bing cherries; home orchard of all kinds of small fruits; 2½ acres berries, 1½ acres potatoes; good well. Beautiful new modern 6-room bungalow with bath, furnace, cellar under whole house, large fireplace, wired for electric lights. Price $6,500. Terms.

451. 40 acres 5 miles out on East Side; 20 acres in trees from 2 to 12 years old, all commercial varieties; all but 4 acres good apple land; near school, church, store and railway station; 6-room house, small barn, all farm tools. Price $11,000. Easy terms.

We have a special list of bearing orchards that will pay better than 15 per cent interest on the investment, prices ranging from $1,000 to $1,600 per acre. These are among the best improved properties in the Hood River Valley. Before investing be sure to see our complete list.

*J. H. Heilbronner & Co., Davidson Building, Hood River, Oregon*

**[The Reliable Dealers]**

# BARGAINS IN HOOD RIVER LANDS

**5 ACRES** first-class apple land, 4 miles from town; all under cultivation; 3 acres in Newtowns and Spitzenbergs. On main county road; small house. Price $2,500. **$1,000 CASH.**

**8 ACRES,** 2 miles out; 6 acres in commercial orchard, fine condition; 2 acres strawberries; good 5-room frame house. Price $5,000. **$2,500 CASH.**

**10 ACRES,** very best soil; 2 acres in bearing orchard; netted $600 last year; 7 acres in 2 and 4-year-old commercial orchard; within one mile of high school. Price $4,000. **$800 CASH.**

**20 ACRES,** all A1 apple land; lays well; 5 acres in 4-year-old comercial orchard. Price $3,800. **$1,000 CASH.**

**20 ACRES,** on the east side, 6½ miles from Hood River; fine deep clay loam soil; 12 acres under cultivation and planted to standard varieties of apples, mostly Newtowns and Spitzenbergs, 5 years old; good frame house, barn and other buildings; abundance of free water from creek. Price $7,000. **TERMS.**

**20 ACRES,** all under cultivation; no waste; ideal location; 16 acres commercial orchard; part full bearing. Price $9,500. **$4,500 CASH.**

**30 ACRES,** all cleared and in high state of cultivation, 6 miles from town; east side district, on county road; about 16 acres in commercial orchard of Yellow Newtowns and Spitzenbergs; balance of place in meadow and garden; good 7-room frame house, hot water tank, bath and telephone; barn and all outbuildings; free water for irrigation. Must be seen to be appreciated. Price $15,000.

**40 ACRES,** good orchard land, 6 miles out; 6 acres standard orchard; produced 2,000 boxes last year; buildings worth $2,000; horses, cows, implements and tools all go. Pays good interest on $20,000.

**55 ACRES,** 2½ miles out; half under cultivation; some orchard, buildings, creek, beautiful view; suitable to cut up into small tracts. Price $11,000.

**120 ACRES,** 5 miles out; good 5-room house; small orchard; 80 acres of this lays fine for orchard. Price $5,500. **$2,000 CASH.**

FOUR-YEAR-OLD APPLE ORCHARD IN HOOD RIVER VALLEY

DEVLIN & FIREBAUGH
LEADING DEALERS

510-511-512 Swetland Building, PORTLAND, OREGON
*Branch Office, Hood River, Oregon*

# BETTER FRUIT

A MONTHLY ILLUSTRATED MAGAZINE PUBLISHED IN THE INTEREST
OF MODERN AND PROGRESSIVE FRUIT GROWING AND MARKETING

## INSECT ENEMIES OF THE PEACH AND REMEDIES

BY A. L. QUAINTANCE, IN CHARGE OF DECIDUOUS FRUIT INSECT INVESTIGATIONS, BUREAU OF ENTOMOLOGY

THE depredations of insects constitute an important obstacle to the profitable cultivation of the peach. This is true, not only in large commercial orchards, but also in the small home orchard, often of not more than a dozen trees; for wherever the peach is grown there will likely be found the "borer" infesting the root-crown and roots, scale insects on the trunk and branches, and, in many sections, the curculio to disfigure and destroy the fruit.

Of about 190 species of insects known to feed habitually or occasionally on the peach, comparatively few are at present seriously destructive, but the ravages of these, as the peach borer, the plum curculio, the San Jose and other scales, the peach twig-borer, etc., bring about in injury to the tree and fruit, a loss in the United States of several million dollars annually. Much of this loss is preventable, as is shown by the experience of numerous individual orchardists who, by proper care and attention, have been able to greatly lessen losses from insect depredations.

Too much stress cannot be placed on the importance in peach culture of maintaining the trees in a thrifty and vigorous condition by frequent cultivation, fertilization if necessary, the thorough pruning out of dead or otherwise useless wood, and the prompt removal and destruction of diseased and dying trees. Orchard management of this character does much to prevent insect injury by maintaining conditions unfavorable to the development and spread of the insects.

### THE PLUM CURCULIO

(Conotrachelus nenuphar Hbst.)

All peach growers in the East are familiar with the "worm" in the peach, the larva or grub of the so-called plum curculio, or "little Turk." This is a native American insect, and was among the first to attract the attention of the early settlers by its depredations on the plums, peaches, and other fruits growing around their homes. Before the introduction of cultivated varieties of stone and pome fruits the curculio undoubtedly fed and bred on wild plums, hawthorns and crab apples, as it does at the present day, and it is probable that from the earliest times it has been quite generally distributed eastward of the Rocky Mountains wherever its food plants grow. The plum curculio is known to occur from southern Canada south to about middle Florida and westward to the region of the Rocky Mountains. West of about the one hundredth meridian, however, it loses much of its importance as a pest, owing to the more arid climate.

The insect passes the winter in the adult or beetle stage under trash on the ground in and around orchards, or in other situations where suitable protection from the weather may be secured. By about the time in spring when the fruit buds are swelling or the trees are in bloom, the beetles come from their winter quarters, and as soon as the fruit is well set it is attacked for feeding and egg-laying purposes, though the beetles also feed on the buds, unfolding leaves and blossoms. Figure 1, Plate XXVII, is an enlarged illustration of a young plum, showing the characteristic crescent shaped egg punctures of the female. Egg laying and feeding continue for several weeks or even months in the case of the hardier individuals. Oviposition, however, is most active during the first four or five weeks. The total number of eggs which may be deposited by an individual female varies widely, probably depending upon climatic conditions and the sort of fruit attacked.

From three to five days, according to the temperature, are required for the egg to hatch, and the resulting larva soon bores into the fruit, where it feeds, usually around the pit in stone fruits, until completing its growth. The larval stage lasts from about twelve to eighteen days. The presence of the larva in the young peach will usually cause it to fall, and much of the infested fruit, if it does not drop earlier, falls with the so-called "June drop," just as the pit begins to harden. Upon completing its growth, whether in the fruit on the tree or on the ground, the larva bores out of the fruit and enters the soil, usually to a depth of not more than two inches, where it pupates. Some three or four weeks are required for the completion of the pupal stage and the emergence of the normally colored beetle. The beetles may, however, remain in the pupal cell days, or even weeks, before leaving the soil, especially if the weather be dry, whereas a copious shower may bring them out in numbers. The period of development of the curculio from egg to adult thus lasts from about five to seven weeks, and as there is but one generation annually, the insect spends about ten to eleven months of the year in the adult condition. Owing to the long period during which the beetles oviposit in the spring, beetles of the new generation, from eggs first laid, are out some time before the parent beetles have disappeared. Beetles of the new generation, after their emergence from the soil, feed on the fruit and foliage of various fruit trees until the approach of cold weather, when they seek shelter for the winter, emerging the following spring to attack the new fruit as indicated.

The natural and original food of the curculio is the wild plum. It also breeds in wild crab apples and hawthorns, and is recorded as breeding in persimmons. Practically all cultivated varieties of stone and pome fruits are attacked, as plums, peaches, cherries, nectarines, apricots, apples and pears, though a preference is shown for the smooth skinned sorts, notably plums.

Injury to fruit by this insect is due to the punctures made by the beetles in feeding, and to the punctures of the females in ovipositing, and also to the work of the larvae within the fruit itself. Much of the fruit injured when small, shortly falls to the ground, but if punctured when of some size it may remain on the tree, and if the punctures are numerous it becomes knotty and mishapen as it grows. (See Plate XXVIII, Figures 3 and 4.) From the punctures made, gum may exude and form globules, which become quite conspicuous during moist or rainy weather, as shown in Plate XXVIII, Figure 2. Cherries, with the exception of one or two varieties, do not fall, the larva completing its growth in the fruit on the tree. Much injury is also done, particularly in the more northern states, to apples and plums by the feeding on the fruit during

Contents

INSECT ENEMIES OF THE PEACH AND REMEDIES
PEACH GROWING IN THE PACIFIC NORTHWEST
PROPER PRUNING AND SHAPING OF PEACH TREES
MEASURING AND DIVIDING WATER FOR IRRIGATION
MUST THE CALYX CUP OF THE APPLE BE FILLED
SUGGESTIONS ON GROWING PEACHES FOR MARKET
STORING PEACHES WITHOUT LOSS OF FLAVOR
MONEY BEING MADE IN GROWING CRANBERRIES
FRUIT SHOW HELD AT COUNCIL BLUFFS, IOWA

the late summer and fall, of beetles of the new generation before they go into hibernation for the winter. In some sections this may be the more important injury. In the South, where early maturing fruit is generally grown, injury by the new generation of beetles is of little importance.

It has been discovered recently that the eggs of the curculio are destroyed by a minute parasite (Anaphes conotracheli Girault), which, according to the limited observations made, destroys from sixty to seventy per cent of them. The larvae are attacked by two parasites, Sigalphus curculionis Fitch and Porizon conotracheli Riley, the former species being much the more important. Certain predaceous insects are known to destroy the curculio larvae as they are leaving the fruit to enter the soil.

### Preventive Measures

Of the many different methods which have been proposed for the prevention of injury to fruit by the curculio, comparatively few are worthy of consideration.

**Jarring**—One of the best, and perhaps the most generally practiced preventive measures at the present day, is the so-called jarring method. Its value depends on the fact that a sudden jar to the tree will cause the beetles to fold their legs and fall to the ground, feigning death as a means of escaping detection. Advantage is taken of this habit to collect the beetles on sheets, held or placed on the ground under the trees. Jarring is begun in the spring, as soon as the fruit is well set, and should be done preferably in the early morning or late evening, when the insects are somewhat torpid with cold and drop quickly. In large orchards it is often necessary to work during midday, though not so many beetles are caught, as they cling to the tree more tenaciously, and after falling escape more quickly. During seasons when the beetles are numerous, it is best to jar the trees every day for a period of four or five weeks, until it is observed that but few beetles are being caught.

Various forms of curculio catchers have been devised, but perhaps the simplest, and one suitable for work on a small scale, consists of a sheet some twelve feet square, made by sewing together strips of heavy muslin, the central seam being left open to the middle of the sheet. The canvas is placed on the ground under the tree, being centered by passing the midseam around the trunk and one margin along the seam being overlapped to entirely cover the ground. A padded pole for jarring the tree completes the outfit.

In jarring on a larger scale the work must be done more expeditiously. A form of catcher much in use in extensive Eastern orchards is shown in Figure 1. This form of catcher consists of a cart on which is carried an inverted umbrella-shaped canvas on a folding frame, with an opening in front to receive the trunk of the tree. In operation the cart is pushed under the tree, which is given a sudden jar by means of a padded bumper at the base of the slit, or preferably with a padded pole. The beetles falling on the hopper-like canvas are brushed down through the opening in the bottom into a can of kerosene fastened beneath. The method of jarring practiced in a large Georgia orchard is illustrated in Figure 2. The work is done by gangs of five hands each, the apparatus consisting of two sheets stretched on frames, each six by twelve feet, and a padded pole for jarring the tree. The sheets are momentarily held under the respective trees as they are carried along, at which instant the tree is given a jar with the padded pole. At the end of the row the sheets are placed on the ground, the curculios are picked off and the beneficial insects permitted to escape.

**Poisoning**—It has been known for several years that the adult curculios feed freely on the foliage and fruit of the plants used for egg-laying purposes, and numerous experiments have shown that injury to fruit may be greatly lessened by thoroughly spraying the trees with arsenical poisons. In the case of the peach, however, repeated applications of poisons such as paris green or arsenate of lead, are likely to be followed by injury to and subsequent dropping of

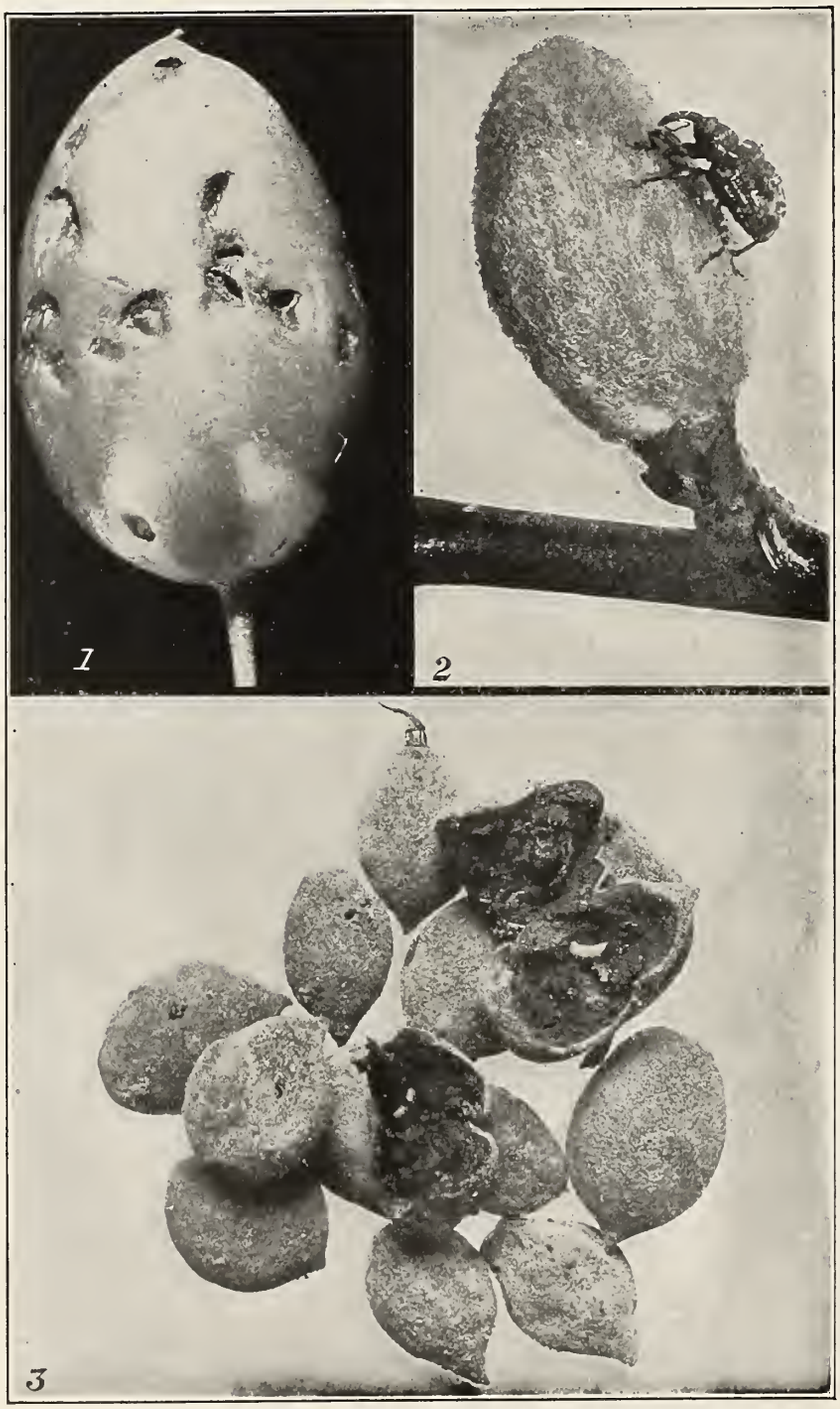



PLATE XXVII.—THE PLUM CURCULIO AND ITS WORK
FIGURE 1—Young plum, showing crescent-shaped egg-laying punctures. FIGURE 2—Adult, or beetle, on a young peach. FIGURE 3—Young peaches infested with larvæ, from ground under tree. Figures 1 and 2, enlarged four times; Figure 3, reduced about one-half. (Original.)

the foliage. But some peach growers habitually spray their trees with arsenical poisons for the curculio and report no injurious effects; and in localities where it has been established that no injury results the practice is to be recommended. But the grower who is using arsenicals on the peach for the first time should proceed with caution. Of the poisons available for this work, arsenate of lead is likely to be least injurious, and it has the advantage of adhering well to the foliage. To be reasonably effective in killing the beetles it should be used at the rate of about two pounds to fifty gallons of water. Paris green, or "green arsenoid," should not be used stronger than one pound to one hundred and fifty or two hundred gallons of water. The caustic properties of these poisons will be greatly reduced by the addition to the liquid of the milk of lime, made by slaking some two or three pounds of stone lime, or the poisons may be used in bordeaux mixture which it is proposed to use in the control of fungous diseases.

In the control of the curculio several applications of the poison are necessary. The first application should be made at once after the blossoms fall, and other applications should be made at intervals of eight to ten days, until three or four applications have been made.

**Cultivation**—In the discussion of the life history of the curculio it was shown that the pupa or quiescent stage of the insect is passed for the great majority of individuals not more than two inches below the surface of the ground. The destruction of these soft, helpless pupae by the crushing action of a cultivator would therefore appear reasonable, and, as it involves no outlay for labor not essential to successful fruit growing, the practice is to be strongly recommended. Pains should be taken to run the cultivators as near the trees as possible, as the majority of the larvae pupate beneath the spread of the limbs. Since the period of maximum oviposition lasts for four or five weeks, it follows that the pupae will be in the ground in numbers over an equal length of time. In the latitude of Washington and southward the larvae begin to enter the soil for pupation in about six weeks after the time of full bloom on the trees, and cultivation should hence be begun by about this time. In Illinois, as shown by Professor Crandall, and probably elsewhere in the more northern states, the larvae are entering the soil in about two months from the blooming period of the trees.

**Gathering Fallen Fruit**—A large proportion of the fruit, other than cherries, punctured while small, will fall before the larvae have completed their growth. Infested fruit will thus be on the ground some days before the larvae leave it to enter the ground. The systematic collection and destruction of this fallen fruit would serve greatly to keep the insect in check, and, where practicable, this method should be followed. Fruit should be collected every two or three days to insure the destruction of the larvae before the fruit has been deserted. Plate XXVII, Figure 3, shows the condition of a few peaches gathered from under a tree in a Georgia orchard.

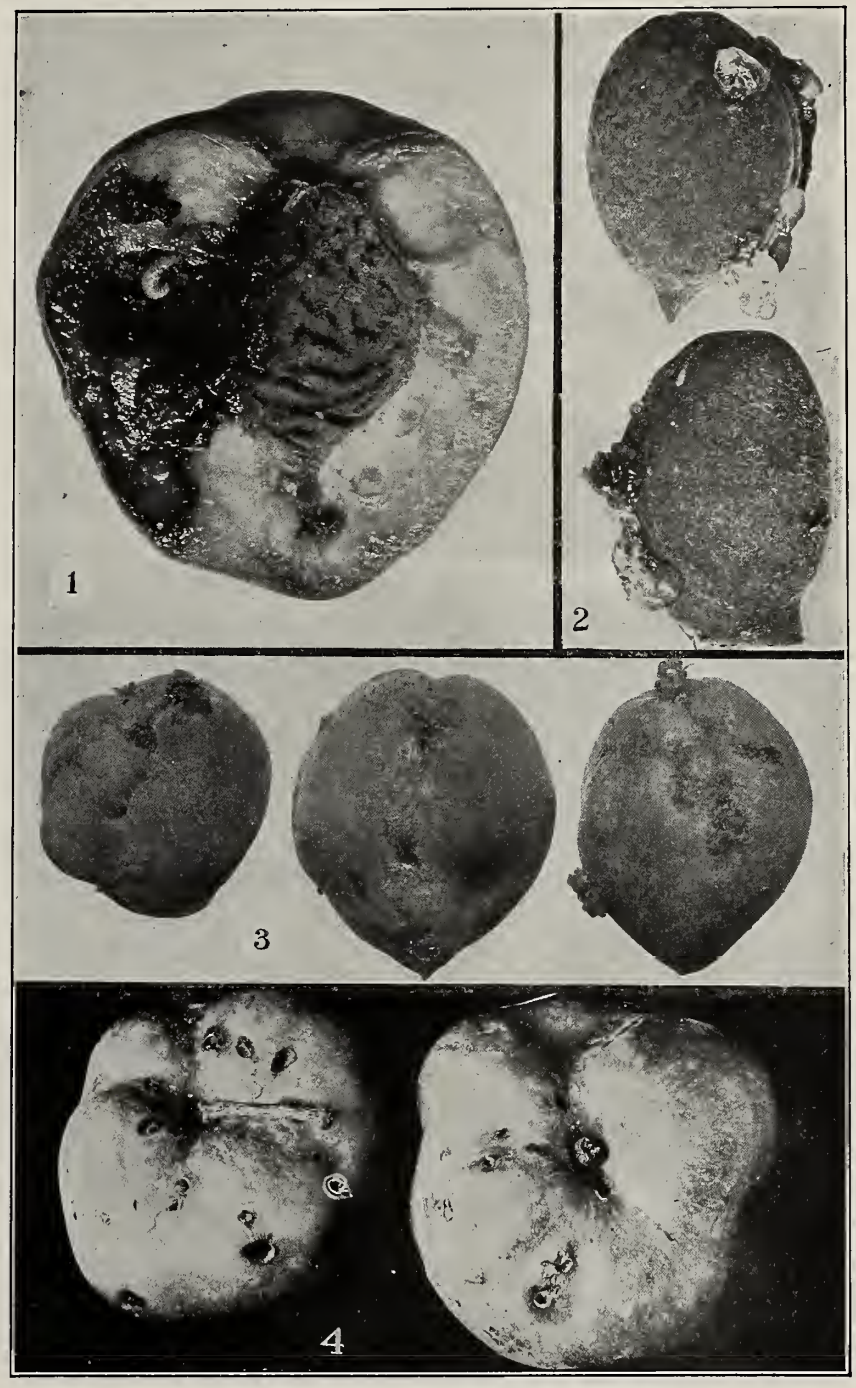



PLATE XXVIII.—WORK OF THE PLUM CURCULIO
FIGURE 1—Larva and its work, in ripe peach. FIGURE 2—Gum exudations from punctures in green peaches. FIGURE 3—Deformed peaches, due to curculio punctures. FIGURE 4—Deformed apples, due to curculio punctures. Figure 1, natural size; Figures 2, 3 and 4, reduced about one-half. (Original.)

**General Recommendations**—In the control of this pest, as of most other destructive insects, clean culture is of great importance as removing conditions favorable to insect multiplication. The numerous plum thickets to be observed in the neighborhood of orchards and along the roads, particularly in the South, are constant sources of infestation of orchards, and should be destroyed wherever possible. In fighting the curculio best results will come from a combination of two or more of the several methods recommended, and uniformity of action by all the orchardists of a community will bring about a great reduction of loss from this pest in that section.

## THE PEACH BORER

(Sanninoidea exitiosa Say.)

In many parts of the country the peach borer is perhaps the most destructive insect enemy of the peach. Injury is done by the larva or borer, which feeds on the soft inner bark at the crown of the root or on the adjacent roots. (See Plate XXX, Figure 2.) The larvae are voracious feeders, and trees are always

greatly injured and often completely girdled by them. The peach is subject to attack throughout its entire life, from the seedling in the nursery row to the oldest relic, though injury is most severe on the younger trees. The presence of the borer is indicated by the exudation from the base of the tree of a brownish, gummy mass, more or less mixed with soil, which, during damp or rainy weather, by the absorption of water, becomes gelatinous and often quite conspicuous. (See Plate XXX, Figure 1.)

The peach borer, like the plum curculio, is a native species, and at present appears still to be confined to Canada and the United States. So far as is recorded, it has not yet become established on the Pacific Coast nor west of the Rocky Mountains, except in Colorado and possibly in New Mexico. There occurs on the Pacific Coast, however, a closely related species (Sanninoidea opalescens Hy. Ed.) of similar life history and habits, and against which the same remedial measures may be practiced. Eastward of the Rocky Mountains, from Canada south to Florida and Texas, the peach borer is almost universally found wherever peach trees are grown.

Its native food plant is thought to have been the wild cherry and possibly also the wild plum. With the introduction of the peach by the early settlers this plant soon became its favorite food, and complaints of its destructiveness are frequent in our early horticultural literature. It is now known to infest various cultivated varieties of stone fruits, as the apricot, nectarine, prune and plum, but it is pre-eminently destructive to the peach.

*Photographs by James H. Beattie*
STEAM PLANTS FOR COOKING LIME-SULPHUR-SALT WASH

There is but one generation annually. The insect winters in the larval or borer condition, the larger individuals simply hibernating in their burrows under the bark, many of the smaller one constructing a cell or hibernaculum outside of the burrow, on the bark of the tree. With the approach of spring, and probably during warm spells during the winter in the South, feeding is resumed. Larvae of various sizes are to be found in the tree at almost any time, varying from quite small to nearly full grown, and the period of pupation and emergence of the moths is thus extended over several months. Upon completing its growth the borer leaves its burrow and constructs a cocoon at or near the surface of the ground, usually on the trunk of the tree near the burrow, but often loose on the soil. Within the cocoon the borer transforms to a pupa, from which the moth or parent will emerge in the course of three or four weeks. Plate XXXI, Figure 1, illustrates the two sexes, the female moth above and the male below. Soon after emergence the moths mate, and the female at once begins depositing her eggs. These are laid rather indiscriminately over the trunk of a tree, on adjacent weeds or trash, or even on the ground. Dissections of females show the ovaries to contain from about two hundred to eight hundred fully developed eggs, the number varying with the size of the individual moth. The moths are day fliers, and both sexes are quite active. The eggs are small, reddish, oval in shape and not readily detected on the bark of the tree. These hatch in from nine to ten days, the young larvae at once seeking cracks in the bark, soon making their way into the soft bark of the tree. Their location is easily detected by the powdery, light brownish frass which they push out from their burrows. The young larvae grow rapidly, feeding until forced into hibernation by the cool weather of fall. Growth is resumed with the coming of spring, as already indicated.

In the control of this species it is important to know as accurately as possible the period of greatest abundance of moths. According to Professor Slingerland, in New York State, and probably in that latitude generally, usually no moths emerge before July 1, and they mostly appear from July 15 to August 15. It is noted, however, that during exceptional years moths may appear as early as June 15, and they have been reared at Buffalo late in September. Results of an investigation of this species at Youngstown, N. Y., by Mr. Fred Johnson, of the Bureau of Entomology, during the season of 1905, largely agree with the statements of Professor Slingerland. The period of emergence of moths was found to be from June 12 to August 24, not many appearing, however, until two or three weeks after the first date men-

tioned. No pupae were found later than August 5.

In the vicinity of Washington, from observations made during 1905, it appears that a few moths may emerge during late May, but they do not begin to emerge to any extent until about the middle of June, and the period of maximum emergence is not reached until some four or five weeks later. The great majority of larvae have pupated and the moths have emerged by the middle of September, though a few stragglers may emerge later. Much the same condition obtains in New Jersey, according to Dr. J. B. Smith, who states that moths of the peach borer emerge in greatest numbers from about June 15 to September 15.

Until recently there have been no accurate data on the period of emergence of the moths in the extreme South. During the past two years, however, Professor H. N. Starnes, of the Georgia experiment station, has determined by careful investigation that the period of emergence of the majority of the moths is from about August 26 to September 15, a few earlier and a few at later intervals, extending even into October.

Results of investigations by the Bureau of Entomology during 1905, at Fort Valley, Georgia, agree fairly with the statements made by Professor Starnes. According to records made by Mr. James H. Beattie, no pupae were found, with one exception, until July 10, from which date they became increasingly abundant. By August 20, it was estimated that fully eighty per cent of the larvae had pupated and many of the moths emerged. By early September pupae were relatively scarce. The period of flight of the moths in any numbers would thus extend roughly from about August 1 to late September. However, Messrs. Scott and Fiske, for some years entomologists to the Georgia State Board of Entomology, while inspecting nurseries during October and early November, often observed the moths in numbers, and further observations are necessary before final conclusions may be reached on this important point.

The periods of maximum emergence and oviposition of the moths for the respective regions indicated, would doubtless be included within the following dates:

For New York and other states of about that latitude, from July 1 to September 1.

For states of about the latitude of Washington City, from June 15 to September 15.

For Georgia and other states of about that latitude, from August 1 to October 1 and possibly later.

In all, seven or eight species of hymenopterous parasites have been found infesting the larva or pupa, and during 1905 Mr. A. A. Girault has bred from eggs collected on peach trees an important egg parasite, Telenomus quaintancei Girault MS. Limited observations in the vicinity of Washington indicate that about fifty per cent of the borer's eggs may be destroyed by this minute insect.

**Preventive Measures**—Under this head are to be considered methods designed to prevent the deposition by the moth of her eggs on the trunk of the tree, or such measures as will hinder or prevent the entrance of the newly-hatched larvae. Of all of these, mounding has perhaps given as good results as any other. Slingerland found in New York State that from one-half to seven-tenths of the borers were kept out of the trees by this practice, and he considers it one of the cheapest and most effective of the numerous methods tested by him. Many successful orchardists rely on this practice alone or in conjunction with "worming," to be mentioned later.

PLATE XXX.—THE PEACH BORER AND ITS WORK
FIGURE 1—Exudation of gum at base of infested tree. FIGURE 2—The "borer" and its cocoon at root-crown of two-year-old peach tree. (Original.)

Mounding consists simply in dragging up the earth, by means of a hoe or otherwise, all around the base of the tree to a height of eight or ten inches. This artificial earth surface will induce the moths to deposit eggs higher on the trunk, and but few larvae will enter the bark much below the place of contact of the mound with the tree, and they may thus be readily destroyed upon the removal of the mound after the period of egg-laying of the moths has passed. Of much the same order is the use of strips of tarred paper, newspaper, or other forms of sheathing, wrapped around the trunk. Two or three inches of soil is first removed from around the base of the tree, and the protector applied. The return of the earth will hold the bottom of the sheathing in place, and it is secured above with a string or other suitable means. Wrapping, or the application of a wash, is often followed by mounding, and when these are employed in conjunction a greater degree of freedom from injury should result.

Perhaps the method most generally relied on, usually in conjunction with worming, is the use of some kind of wash painted on the trunks of the trees. The number of these washes is very large; many are quite worthless, while others are positively injurious to the

tree. Lime, soap, clay, glue, white lead, carbolic acid, tobacco decoction, kerosene, sulphur, and paris green, are some of the ingredients, in various combinations, which enter into their composition. Many washes are concocted in the belief that some one ingredient, as carbolic acid, will be offensive to the moths, while another, as paris green, will destroy the just-hatched larvae as they bore into the tree. There is no evidence to show that the moths are affected by such odoriferous substances, and the fact that the great majority of the young larvae enter the bark through cracks and do not bore directly through the poisoned coating, renders substances of a poisonous nature ineffective. Washes containing paris green or other arsenites, especially with glue or paint as a base, are likely to be injurious, though moderate quantities of poison in a wash, with lime as a base, have been used without injurious results. On young, thin-barked trees, however, washes containing arsenites should be used with the greatest caution. Lime, perhaps, forms the base of the greatest number of washes, one or more other ingredients being added according to the fancy of the user. One of these which, in the hands of Mr. J. H. Hale, is reported as giving good results, is made as follows:

Two quarts of soap, half pint of crude carbolic acid, and two ounces of paris green, all thoroughly mixed with a bucketful of water, to which enough lime and clay have been added to make a thin paste.

Several substances which maintain a fairly impervious character have been tried at different times, but unfortunately their use is not without risk of injury. Of these, white paint, printer's ink, and two of the common brands of insect lime are, according to Professor Slingerland, fatal or injurious. In his hands gas tar proved very effective, keeping out from four-fifths to all of the borers, and doing no injury to the trees. In the hands of others, however, serious injury has at times resulted, and where its use is contemplated it should first be tried in a small way.

Whatever the method or methods adopted, whether mounding, the use of paper or similar protectors, or the use of washes, these should be applied to the trees before the period of flight of the moths and should remain in working order until this period has passed.

**Remedial Measures**—After the borers have once penetrated beneath the bark the use of washes or mounding are of no avail, and the old-time process of digging them out, or "worming," is still the best of the direct remedial measures. Worming is done usually in the spring or early summer, and often again in the fall, though at this time many of the larvae are quite small and are liable to be overlooked.

In California, Professor C. M. Woodworth has been able to successfully treat the related borer infesting the peach, the larva of Sanninoidea opalescens, by the injection of carbon bisulphid into the ground around the base of the tree. The larvae were killed in their burrows and no injury done to the trees. In New York State, however, this method was condemned by Slingerland on account of its cost, as being ineffective in killing the borers, and as being dangerous to the health of the tree.

### THE LESSER PEACH BORER

(Aegiria pictipes G. & R.)

In the course of investigations of the peach borer by the Bureau of Entomology during 1905, another borer was found infesting the peach, inhabiting principally the trunk, especially of old trees or those showing injury from freezing or other causes.. This insect, to be known as the lesser peach borer, has been found in Western New York and adjacent portions of Canada, in Maryland and Virginia, and in Georgia, so that it would appear to be widely distributed. In the last mentioned state it is very abundant and is the cause of important injury, infesting principally the trunks of older trees, feeding on the soft bark, excavating burrows after the manner of the true peach borer. It has, however, been frequently taken at the crown of the root and under these circumstances might readily be confused with the other species. (See Plate XXXI, Figures 3 and 4, showing the cocoon and empty pupa case and female and male moths, respectively, all enlarged on same scale with Figures 1 and 2, the true peach borer, of the same plate.)

To control this species it will be advisable to closely examine the trunks as well as the crowns of the roots during the time of worming for the peach borer.

PLATE XXXI.—ADULTS AND COCOONS OF PEACH BORER AND LESSER PEACH BORER
FIGURE 1—Peach borer moths, female above, male below. FIGURE 2—Cocoon and empty pupa case of peach borer. FIGURE 3—Cocoon and empty pupa case of lesser peach borer. FIGURE 4—Lesser peach borer moths, female above, male below. All figures twice enlarged. (Original.)

### THE SAN JOSE SCALE

(Aspidiotus perniciosus Comst.)

But a few years ago the San Jose scale was considered a veritable menace to the

growing of deciduous fruits in the East, and its discovery in an orchard was often followed by the destruction of the trees, in the hope that its extermination might be secured. However, this feeling of alarm has now given way to one of confidence that the pest may be controlled by the proper use of insecticidal sprays, and without belittling the serious character of the insect, it may be said that it has simply taken its place among the several insect pests of the orchard whose control must be enforced as a regular feature of orchard work.

Since its introduction into the East from California some seventeen or eighteen years ago it has become established in the principal deciduous fruit regions in the more Eastern states from Canada south to Florida and Texas. There are still many fruit-growing sections within this area where the scale has not made its appearance, and no effort should be spared to keep it out for as long a time as possible; but its appearance in an orchard should not be the occasion of the destruction of otherwise valuable trees, in view of the fact that it can be controlled by thorough, painstaking work with the spray pump. The insect is introduced into new localities principally on nursery stock, but once established under conditions of neglect it spreads more or less rapidly from orchard to orchard. The system of inspection and fumigation of nursery stock which has been in practice for some years in most states, has been an important means of restricting its more general distribution, and prospective purchasers of trees should assure themselves of their freedom from this and other pests likely to be distributed from nurseries.

The San Jose scale is practically an omnivorous feeder, having been reported from some sixty plants and the list is being gradually extended. It is worthy of note, however, that, with the exception of a few incidental plants, it is able to live and multiply in injurious numbers only on members of the Rosaceae, to which family our deciduous fruits belong.

If permitted to multiply unrestricted, young trees will usually succumb to its ravages in three or four years, often in two or three years. Older trees may withstand it longer. The smaller limbs and branches are usually the first to be killed, and the tree will throw out from below a varying number of shoots. (See Plate XXXII, Figure 1, illustrating a peach tree thus injured.) With trees in fruit, especially apples, plums and pears, the fruit will frequently be quite ruined for market purposes by settling upon it of the young scales.

An individual San Jose scale is quite small, grayish, circular in outline, somewhat convex, and with quite a nipple-like prominence in the center. The female scale is about a millimeter in diameter, the male being smaller and elongate. (See Plate XXXII, Figure 2, showing an infested peach twig, enlarged four times.) The insect itself is beneath the so-called scale, which is simply a waxy covering secreted by the soft, yellow, helpless louse for its own protection. Where trees are but slightly infested its presence is not readily detected by the casual observer; but in cases of severe infestation the bark of the tree and limbs will present an ash-gray appearance, and on examination will be found thoroughly incrusted with the scales. These may be readily scraped off with a knife, producing a yellowish, oily fluid from the crushed bodies of the insects. Plate XXXII, Figure 3, illustrates a section of limb of peach tree thickly infested with the scales, twice enlarged. When thus abundant on a tree the foliage will be thoroughly infested, giving it a spotted and diseased appearance, readily observed some feet away, thus aiding in its more ready detection.

Trees which from neglect of treatment have been practically killed by the scale should at once be cut down and burned, and, if desired, new ones planted in their places. Trees which have been severely injured, the tops being more or less killed, should be closely pruned and all parts thoroughly treated with a suitable spray. Trees thus injured may be much more quickly brought into condition by thorough cultivation of the land and the use of fertilizers.

**Lime-Sulphur-Salt Wash**—This wash is now, perhaps, the main reliance in the control of the San Jose scale in commercial peach orchards in the East, as it has been for many years on the Pacific slope. When properly made and thoroughly applied it has proven to be the most satisfactory of the several washes available for the control of this pest on all deciduous fruits. Its use on dormant peach trees, with unimportant exceptions, has proven to be without any injurious effects whatever to the tree or fruit buds. The exceptions to be noted are reports of injury to terminal twigs, due apparently to their immature condition by reason of late growth in the fall. The wash is applied in the spring, before the fruit buds open, or, in the case of badly infested orchards, both in the late fall and spring. In regions where peach-leaf curl is troublesome, the spring application will almost entirely prevent it.

There is some variance at present as regards the quantities of the respective ingredients of the wash which should be used; also as to the details of its prepa-

Plate XXXII.—THE SAN JOSE SCALE AND ITS WORK
Figure 1—Peach tree with top killed by the scale. Figure 2—Peach twig, moderately infested, showing male and female scale. Figure 3—Peach limb badly infested with scale. Figure 2, enlarged four times; Figure 3, enlarged twice. (Original.)

ration. There seems to be, however, considerable latitude in these particulars without seriously affecting its efficacy. Of numerous formulas tested by the Bureau of Entomology in 1905, the following, which is substantially the formula hitherto recommended by the Bureau reduced to the fifty-gallon basis, was found satisfactory:

| | |
|---|---|
| Best stone lime | 20 pounds |
| Flowers (or flour) of sulphur | 15 pounds |
| Common salt | 10 pounds |
| Water to make | 50 gallons |

The lime should all be slaked in a cooking barrel or vessel, using of hot water about one-third of the total required; and while the lime is vigorously slaking add the sulphur, which should previously have been made into a thick paste with water, and next add the salt. When the lime has slaked add water to make up to about two-thirds of the total amount required, and cook for about one hour, after which add water to make the total required amount of wash. Strain as it is being poured into the spray tank or barrel and apply before it cools. The wash may be cooked in open kettles or with steam in barrels or tanks. The use of salt is apparently not essential to the effectiveness of the wash, and may be omitted if desired. In the case of badly infested orchards being treated for the first time it is advisable to strengthen the wash by the addition to the formula of five pounds each of lime and sulphur.

One application of the wash during the spring of each year, is usually quite sufficient to keep the scale under control.

For the cooking of the wash on a small scale, large open kettles may be used, but when large quantities are needed, the use of steam will be found much more convenient and economical. Most large orchards now have steam cooking plants, varying much in detail, as shown. Many growers prefer large tanks to barrels for cooking vessels, making up large quantities of the wash at once, thereby effecting a saving in fuel and labor.

Whale oil or fish oil soap is especially useful where only a few trees are to be treated. It is dissolved in water by boiling, at the rate of two pounds to the gallon, and if a spray pump is to be used the solution should be applied hot. A wash made from potash-lye soap is preferable to one made of a soda soap, since the latter used at the strength mentioned is likely to become gelatinous on cooling, and hence will be difficult of application. Perhaps the principal objection to whale oil soap is its cost as compared with other washes, and to the fact that as sold on the market it is of quite variable composition. A potash-lye soap should be insisted on, and one that contains not more than thirty per cent of water. The wash is applied in the late spring.

In general the use of kerosene and crude petroleum on peach trees in the East is attended with much risk of injury to trees and fruit buds, though in the hands of many growers such injury has never been noted. In theory, these oils constitute an ideal treatment for scale infested peach trees, but the serious injury often following their use has placed them in disrepute and they are now practically displaced by the safer and cheaper lime-sulphur-salt wash.

Kerosene and crude petroleum are used either pure or in soap or mechanical emulsions with water. When used undiluted the greatest care must be exercised that the trees be sprayed only sufficiently to moisten the trunk and branches, and especially that no oil be allowed to form puddles around the tree. Applications should be made only during bright, dry days, so that the oil will evaporate from the trees as quickly as possible. The ordinary kerosene or coal oil (150 degrees flash test) is used. The crude petroleum should show from 43 to 45 degrees Baume. Kerosene and crude petroleum are more commonly used diluted—that is, in soap or mechanical emulsions with water. A twenty per cent soap emulsion, which is about the right strength for a dormant peach tree, is made as follows:

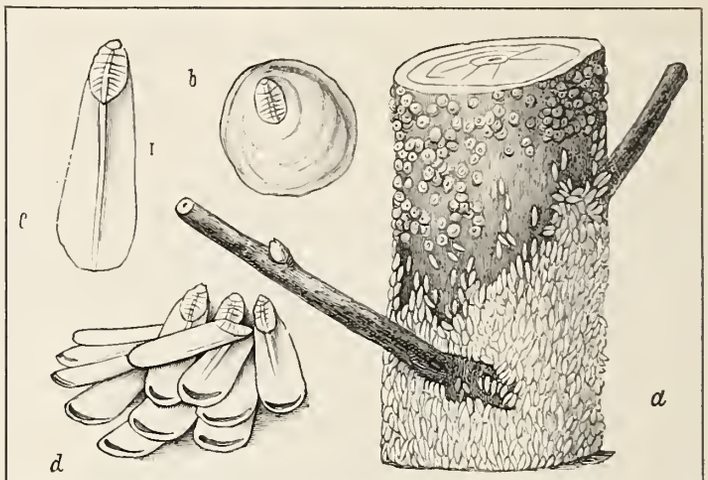



FIGURE 82—The West Indian peach scale (*Diaspis pentagona*): *a*, infested branch; *b*, female scale; *c*, male scale; *d*, group of male scales. (Howard.)

| | |
|---|---|
| Whale-oil or other soap | 2½ pounds |
| Kerosene or crude petroleum | 10 gallons |
| Water to make | 50 gallons |

The soap is dissolved in five gallons of hot water, which is at once poured into the spray-pump barrel. The ten gallons of kerosene or crude petroleum is next added, and the whole thoroughly emulsified by pumping it back through the hose into the barrel for six or eight minutes. After the oil has become thoroughly emulsified the barrel is filled with water, and the preparation is ready for use.

Various spray pumps are now on the market which are designed to mechanically mix with water any desired percentage of kerosene or crude petroleum in the act of spraying. In the use of such pumps care must always be exercised to see that the desired percentage of oil is being discharged from the nozzle, or injury to the trees or ineffective work is likely to result.

FIGURE 1—WHEELBARROW CURCULIO CATCHER USED IN NEW YORK STATE (FROM SLINGERLAND)

## THE WEST INDIAN PEACH SCALE

(Diaspis pentagona Targ.)

Next to the San Jose scale the West Indian peach scale is undoubtedly the most destructive of the scale insects affecting the peach in the United States. According to Mr. Marlatt it is a native of eastern Asia. It was first discovered in the United States in 1892, infesting seedling peach trees growing on the Department grounds at Washington, though old trees throughout the city were soon afterwards found to be infested in a way to indicate that it had been present in the District of Columbia for a number of years. The species has been discussed at length by Riley and Howard in "Insect Life" (Vol. VII, p. 287), and again by Dr. Howard in the Yearbook of this Department for 1894. Owing to its general occurrence in the West Indies it was at one time supposed to be native to those islands, hence its

common name. It is known, however, to occur in many parts of the world.

Throughout its wide range this species attacks many different species of plants. In the United States it is injurious particularly to the plum, peach, prune, cherry and apricot among deciduous fruits, and to a considerable list of ornamental plants, as lilac, hibiscus, etc.

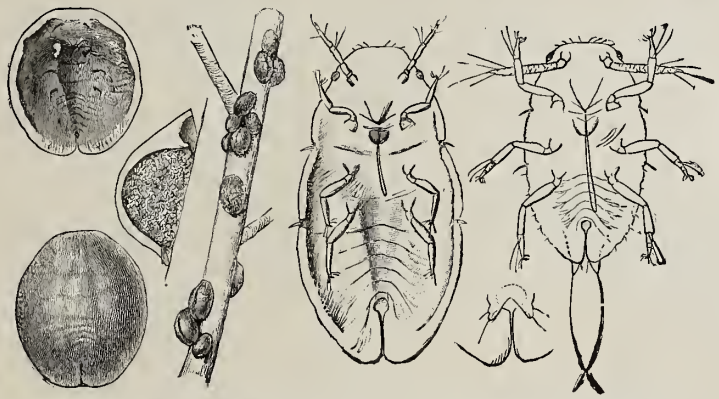


FIGURE 83—Peach lecanium (*Eulecanium nigrofasciatum*): Adults at left, natural size and enlarged; young at right, much enlarged. (Howard.)

This species is illustrated in Figure 82, in which **a** shows a branch covered with female and male scales, natural size, and these are shown enlarged at **b** and **c** respectively. The scale of an adult female is circular, rather convex, grayish in color, and often not readily distinguished from the adjacent bark, the scales of which may more or less cover it. The male scales are elongate, white, and on badly infested trees occur in such numbers as to give the trees a whitish appearance, as if whitewashed. In the latitude of Washington there are three broods each year. In Georgia, according to Mr. W. M. Scott, there are three or four broods each year, the young of the first brood appearing during a favorable season about the middle of March. Mr. G. F. Mills, of Quintette, Florida, according to Professor H. A. Gossard, believes that there are in that latitude four broods per year, and sometimes five. On account of its prolificness and rapidity of development it is capable of doing serious damage even during a single season, and if treatment be neglected the death of infested trees is certain to result. In the South, where it has become established, it is almost equally destructive with the San Jose scale.

The treatment of orchards, and remedies advised in the control of the San Jose scale, will be equally effective in the control of this species.

## THE PEACH LECANIUM

(Eulecanium nigrofasciatum Perg.)

The branches and foliage of the peach are often noticed to have a dark, smutty appearance, as if covered with soot. This usually indicates the presence of the peach lecanium, though not always, as this condition may result from the presence of plant lice, or more properly speaking, aphides. The black, sooty substance is a fungus which grows on the honeydew excreted in considerable quantities by these scales, which infest the smaller branches and twigs of the tree, the males often occurring on the foliage. The peach lecanium, or "terrapin scale," was long considered identical with the European peach lecanium (Eulecanium persicae), but it was established by Pergande in 1898 to be a distinct species. Mr. Pergande considers it a native of the United States and probably indigenous to the territory south of New York and north of the Potomac River. Whatever its origin, it has now become quite widely distributed, being known to occur in many localities in the eastern part of the United States, from Canada as far south as the Gulf of Mexico. Throughout its range it subsists on a considerable number of food plants, as plum, peach, apple, olive, maple, linden, sycamore and birch.

The female insect is illustrated, about natural size, on twig, in Figure 83, and enlarged, in ventral, dorsal and lateral views, to the left. The males are much smaller, elongate, slightly convex, and greenish white in color. They occur on the twigs among the female scales, some usually making their way to the foliage. There is apparently but one generation each year, the insect passing the winter mainly in the condition of the advanced female. The overwintering insect matures early in spring, depositing her numerous eggs in a mass beneath her body scale. In Missouri, where this species has been studied by Miss Murtfeldt, the eggs begin to hatch by June 10, and hatching continues for about a month. The males begin to appear by July 22, living about one week. The females continue growth until the approach of cold weather, hibernating in an immature condition, as stated.

It is probable that in orchards treated for the San Jose scale the treatment will also serve to keep this species under control. Where this pest only is present it is best treated by thoroughly spraying the infested trees with fifteen to twenty per cent kerosene emulsion or whale oil soap solution, one pound to four or five gallons of water, just as the eggs are beginning to hatch. As the period of hatching extends over about one month, one or two subsequent applications are advisable.

## THE BLACK PEACH APHIS

(Aphis persicae-niger Er. Sm.)

The black peach aphis infests the roots, tender shoots and foliage of the peach, causing more serious injury when occurring on the roots. Its presence on the roots is often unsuspected, the failure of the trees being attributed to other causes. Young trees recently planted are most subject to injury, before they have become well established in the soil. Infested trees may fail to grow well, at the end of two or three years being scarcely larger than when planted. The foliage assumes a yellowish green, sickly appearance, the leaves becoming somewhat curled on the edges and blotched with red, suggesting a wet soil or incipient "yellows."

The insects occur in two forms—winged and wingless—the former occurring only on the shoots and leaves, while

FIGURE 2—CURCULIO CATCHER MADE OF SHEETS ON FRAMES, USED IN GEORGIA (ORIGINAL)

the latter occur on both the foliage and roots. An individual aphis is quite small, the body in both forms averaging about two millimeters in length, shining jet black or dark brown in color, oval in shape, though the body of the wingless form is stouter. Both forms are illustrated, much enlarged, in Figure 84. The young are faint greenish-brown in color, gradually becoming darker as they grow, till the jet black condition of the adult is reached. Aphides of all ages occur promiscuously together, often in such numbers as to practically hide the infested parts. They feed by means of a beak, which is thrust into the tissues of the plant, and the sap removed by their combined attack constitutes a serious drain on plant vitality. The insect lives on the roots of the plant during the entire season, and breeding is continuous except during the winter, which is spent in hibernation. The aphides are usually attended by ants, which aid them in securing food, transporting them from place to place and otherwise caring for them. The ants secure from the aphides for food, quantities of honey-dew which is excreted by them. In the spring the aphides make their way above the ground and begin to feed and breed on the tender growth just pushing out. The young are born alive, the progeny soon becoming mature and giving birth to living young in their turn. They thus multiply very rapidly, an aphis soon becoming the progenitor of many thousands. The winged aphides fly readily and migrate to other trees, where new colonies are started. The insect is thus principally spread in orchards or localities where it has once become established. During summer the aphides for the most part are to be found on the roots, though a few may be found on the foliage and shoots in badly infested orchards at almost any time during the growing season. Below the ground they occur more or less promiscuously on roots of all sizes, but the smaller and more tender ones are preferred. Some of the aphides may retain their hold on the roots after the trees are dug, and the insect is thus frequently distributed on nursery stock. The general practice of fumigation by nurserymen now renders their distribution much more unlikely than formerly. Light, sandy soils are worst infested, though they have been found in abundance on stiff clay soils.

Trees from the nursery should be carefully examined before planting, and if aphides are found on the roots these should be destroyed by dipping the roots in strong tobacco water, kerosene emulsion or whale oil soap solution. The precaution should be taken to purchase trees only from nurserymen who practice fumigation. Where the pest has already become established on the roots of orchard trees, its control is often quite difficult. Heavy dressings of kainit, according to Dr. J. B. Smith, are effectual in killing aphides. The fertilizer should be applied over the ground covering the root area of the tree, preferably just before a rain. Unleached wood ashes, from one-half to one bushel per tree, is recommended by Petit as being very effective. It is better to first remove the soil over approximately the root area of the tree, replacing it after the ashes have been applied. Ground tobacco dust may be used in the same way. In all of these substances the insecticidal properties leach out, coming in contact with the soft bodies of the aphides on the roots and thus killing many of them.

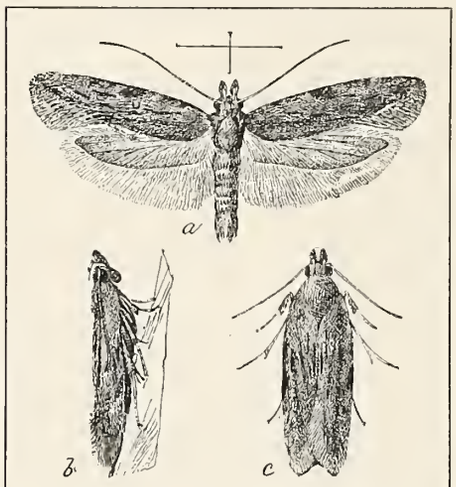


FIGURE 85—Peach twig borer (*Anarsia lineatella*); *a*, Moth with spread wings; *b* and *c*, same with wings closed. All much enlarged (From Marlatt.)

Mr. H. G. Welch, of Douglas, Michigan, reports much success from the free use of stable manure applied around the trees, which are thus enabled to outgrow the effects of the aphides. In general, it would seem that injuries from the pest would be overcome to a considerable extent by supplying the tree with an abundance of plant food in the way of fertilizers and by cultivation. Professor Wesley Webb, of Delaware, reports success in the control of this pest in nurseries in the sandy soils of that state by the free use of tobacco dust as a fertilizer, drilled in with the seed, or later along the rows of the trees.

## THE PEACH TWIG BORER

(Anarsia lineatella Zell.)

The peach twig borer, of European origin and first noticed in this country in 1860, is now quite generally distributed over the United States. It is particularly destructive in the more Western states, as California, Oregon and Washington; there constituting a permanent and serious enemy of the peach, attacking also the prune, nectarine, apricot, almond and pear. In California, where it has been carefully studied by Mr. E. M. Ehrhorn and also by Mr. W. T. Clark, it is perhaps the most serious pest with which the peach growers have to contend. The losses of fruit during the four years from 1898 to 1901, as estimated by Mr. Clark, amounted to $1,373,000. Injury is done (1) by the overwintering larvae to tender shoots in early spring, and (2) by the summer generations of larvae to the fruit, especially to the later varieties. The latter constitutes its principal injury.

In the Eastern states this species has at times been the occasion of serious injury, though this has practically been limited to the destruction of the tender shoots of the peach in early spring by the overwintering larvae.

The adult, a moth of the family Gelechiidae, is shown enlarged in Figure 85, the exact length of body and wing expanse being indicated by the hair lines at the top of the figure. The larva and pupa are shown at **b** and **c**, respectively, of Figure 86, and **a** illustrates the withering effect on a young peach shoot resulting from attack by the larva. As shown by the hair line, the larva is about one-half inch long, and the pupa somewhat less. The larva is pinkish or brownish in color, while the pupa varies from light to dark yellow.

Several observers have contributed to our present knowledge of the life and habits of this species, notably Messrs. Ehrhorn and Clark in California, Cordley in Oregon and Marlatt at Washington. The insect passes the winter as a very small larva in silken-lined cells or burrows in the spongy tissue of the bark at the crotches of the limbs. Their pres-

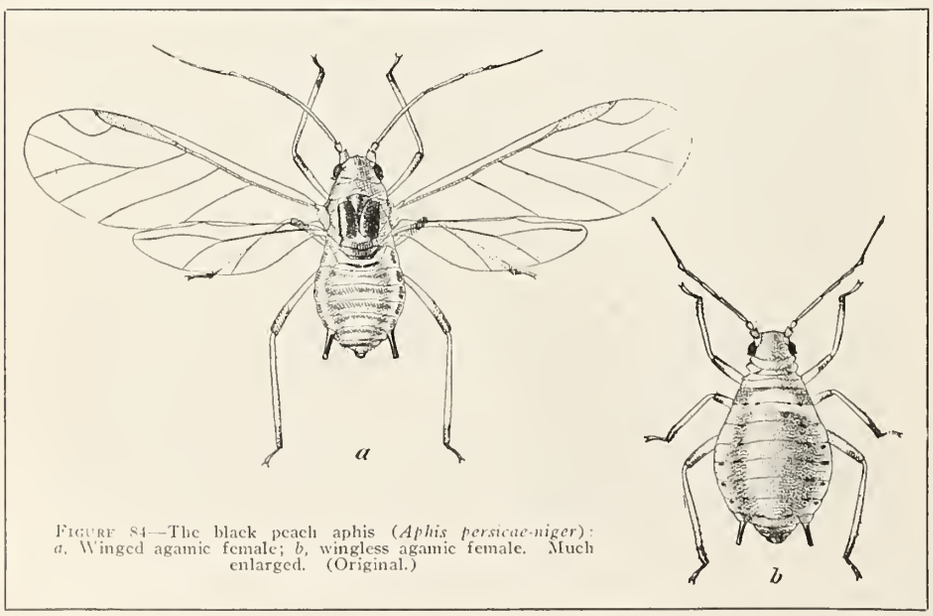


FIGURE 84—The black peach aphis (*Aphis persicae-niger*): *a*, Winged agamic female; *b*, wingless agamic female. Much enlarged. (Original.)

FIGURE 86—Peach twig borer: *a*, A new peach shoot withering from work of larva; *b* and *c*, larva and pupa, respectively; *d*, tip of pupa, side view. Hair line indicates actual length. (From Marlatt.)

ence is indicated by small mounds of comminuted bark, as shown in Figure 87, at **a** and **b**. Early in the spring, as the foliage is putting out, the larvae burrows and attack the tender shoots, boring into and down the pith, the galleries ranging from about one-third inch to one and a half inches in length. The shoot thus injured soon wilts and dies, as shown in Figure 86, at **a**. Many shoots may be attacked by a single larva, which is thus capable of doing considerable harm.

There are two or three generations of larvae during the summer in the West, those of the second and third attacking the fruit, the later varieties being the worst injured. According to Professor C. V. Piper, the larva enters the peach at the stem end, usually boring into the pit, the seed of which it seems to prefer, usually causing the stone to split as the fruit ripens; or simply the flesh may be tunnelled, depending on whether or not the stone is hard when the fruit is attacked. In California, according to to Clark, the larva usually enters the fruit along the suture at the stem end, excavating a chamber beneath the skin, which blackens and shrivels somewhat, affording entrance to organisms of decay. In the ripe fruit the larvae frequently make their way to and around the stone, which, if split, may be entered and the seed fed upon. According to the observations of Mr. Marlatt, at Washington, the larvae of the summer broods feed beneath the bark or in the fruit stems of the peach, occasionally when nearly full grown boring into the fruit. Early in the fall, about September 1 in California, the very young larvae from eggs of the last generation of moths, construct their hibernation cells in the soft tissue in crotches of limbs (see Figure 87), where they remain until the following spring, thus spending some six months in this condition.

Mr. Ehrhorn secured excellent results by winter spraying of trees with strong kerosene emulsion. The castings at the mouth of the burrows, referred to under the discussion of the life history, readily absorb the oil, which, penetrating the burrow destroys the larva. These results were confirmed by Professor Piper in the Snake River Valley (Farmers' Bulletin No. 153, U. S. Department of Agriculture).

In the experience of Professor Piper, the use of lime-sulphur-salt wash was without beneficial results. However, in recent extensive experiments with this wash in California by Mr. Clark, he finds it a most effective remedy. The application should be begun as the buds begin to swell, and may be continued without injurious results until after the blossoms have begun to appear, this period coinciding with the escape of the larvae from their hibernation burrows. With either treatment the applications must be made with great thoroughness to insure the coating of every part of the tree.

## THE FRUIT TREE BARKBEETLE

(Scolytus rugulosus Ratz.)

Injury to the peach by the fruit tree barkbeetle is usually first indicated by the exudation of gum from the trunk and branches, forming numerous globules, and later by the presence in the bark of numerous small round holes, as if the tree had been peppered with shot. As a rule, only trees in a weakened or sickly condition are attacked, but injury

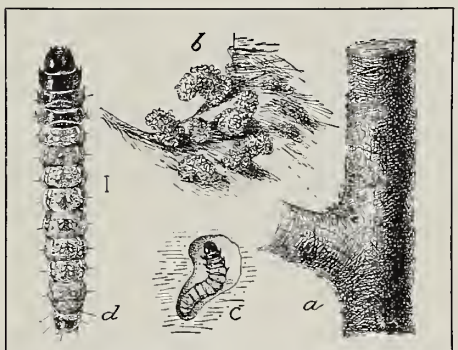



FIGURE 87—Peach twig borer: *a*, Twig of peach showing in crotch minute masses of chewed bark above larval chambers; *b*, same, more enlarged; *c*, larva in its cell, enlarged; *d*, young larva from above, more enlarged. (From Marlatt.)

to apparently healthy trees has been observed. The insect causing this trouble is a small cylindrical beetle, about one-tenth of an inch in length and about one-third as wide. Closely examined, it is seen to be uniformly black in color, except a portion of the legs and the tips of the wing covers, which are dull red. The insect is shown in the adult, pupal and larval stages in Figure 88, the hair lines indicating the natural length. Generally speaking, the beetles infest only such trees as are sickly or weakened, as from neglect, injury from borers or other causes. The copious gum exuded by hardy peach trees seems to be fatal to the purposes of the beetles, by filling up their holes and breeding chambers. Where the insects are very abundant, as becomes possible in orchards containing many sickly and dying trees, their continued attack on healthy trees and the resulting loss of sap may so weaken them that they finally become suitable for the breeding purposes of the insect. Upon the decline of a tree, from whatever cause, it at once becomes subject to attack. The beetle bores a small hole through the bark, beneath which a vertical brood chamber is constructed, along the sides of which little pockets are excavated, where the eggs are deposited. Egg laying begins by the time the brood chamber is about three-fourths of an inch long, and is continued from time to time as the burrow is lengthened. The completed burrows average about one and a half inches in length. The young larvae start boring galleries, more or less at right angles to the brood chamber, but these galleries soon take various directions. If attack has been severe the trees may soon be girdled. There are several generations annually. In the latitude of Washington, Dr. Chittenden is of the opinion that there may be three broods, while in the extreme South, according to Mr. C. F. Baker, breeding is apparently continuous through the spring, summer and fall.

The fruit tree barkbeetle attacks plum in preference to other plants, and apple, peach and cherry are about equally attractive. Pear, quince, apricot, nectarine, mountain ash and Juneberry, are also infested, and in Europe, to which it is native, hawthorn, elm and mountain ash are said to be among its food plants.

In orchards where proper attention is given to maintaining a healthy, vigorous condition of the trees, but little is to be feared from the fruit tree barkbeetle. Since it is not able to multiply to any extent save in trees that are in a weak, diseased or dying condition, these should frequently be searched for and at once destroyed by burning. It will not be sufficient to simply cut them down, for the beetles will continue to breed in portions of a tree left lying on the ground, thus reinfesting the orchard.

## NEMATODE ROOT GALL

(Heterodera radicicola (Greeff) Mull.)

In the light sandy soils of the Southern states a very prevalent and important affection of the peach is the so-called "root knot" or "root gall," due to the work on the roots of a microscopic nematode worm (Heterodera radicicola (Greeff) Mull). Although the organism responsible for this malady is not an

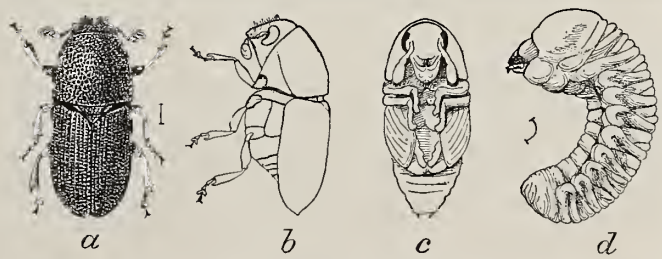



FIGURE 88—Fruit tree barkbeetle (*Scolytus rugulosus*): *a*, Adult beetle; *b*, same in profile; *c*, pupa; *d*, larva. Enlarged about ten times. (From Chittenden.)

insect, nor is it nearly related to insects. its importance as a pest of the peach in the territory mentioned, warrants its brief consideration in this connection, especially since, in the minds of many orchardists, the root knot is believed to be the result of insect work. At the present time, this and other nematode diseases are the subject of special investigation by Dr. Ernst Bessy, of this Department.

The affection is too well known to Southern orchardists and nurserymen to require special description. In addition to the peach, a very long list of plants are attacked with varying severity, according to the species, including most garden vegetables and common weeds. The cowpea is especially subject to attack, and the expediency of the cultivation of this crop for soiling purposes in orchards where the nematode prevails is a question concerning which considerable difference of opinion prevails among practical orchardists. On the whole, it is probably the consensus of opinion that the benefits to the soil do not offset the increased injury to the trees by the propagation and spread of the disease. A variety of cowpea, namely, the Iron, is practically immune from nematode injury, and the planting in orchards of this variety is to be recommended. The small nitrogen tubercles, normal to the roots of the cowpea and other legumes, should not be confused with the deformities caused by the parasite under consideration.

In planting orchards, new land, uninfested by the parasite, should be selected, if possible, and care should be exercised to secure trees for planting free from the root knots. Trees infested from the nursery fail to grow off well, often dying in from one to two years, and trees infested soon after planting, by reason of the presence of the nematode in the soil, rarely attain normal growth and productiveness. Theoretically, conditions of high fertility which would induce a vigorous growth of tender roots are favorable to the parasite. However, some orchardists have found that the free use of fertilizers, as stable manure, mulches, or commercial fertilizers, will, in most instances, insure a vigorous tree in spite of the parasite. Owing to the considerable number of weeds and other plants upon which this pest will breed, clean culture in orchards is very essential in its control.

The use of Marianna and other plums as a stock for the peach, once much in vogue on account of the immunity of the roots of these varieties from nematode injury, has been practically discontinued on account of their unsuitableness for this purpose.

ELBERTA PEACH ORCHARD. TREES ONE AND TWO YEARS OLD, PRUNED BACK TO THE FLAT TOP STYLE
This orchard at Palisade, Colorado, was set out by C. E. Whistler (the man in the foreground of picture), who is now proprietor of the famous C. E. Lewis pear orchard, near Medford, Oregon. This orchard sold for $4,000 per acre when four years old and could not be bought today for $5,000.

## PLANT PEACH TREES

EVERY owner of a piece of land, even though no larger than a town lot, should plant at least two or three. No other fruit tree produces fruit so quickly and abundantly and with such satisfactory regularity. No other fruit is so universally popular among all classes and in all markets. Planted in commercial quantities in suitable soil and location, no other fruit is more profitable to the grower. On town and city lots, as well as in all family plantations, peach and cherry should predominate. With very little attention the trees may be grown into beautiful specimens, fitting ornaments to any grounds. But the satisfaction to the planter of a peach tree comes with the ripening fruit—great globules of delicious, juicy pulp, so far superior to the green picked, distance shipped peach as to be scarcely recognizable as the same fruit.

The so-called "peach belt" is being carried further north year by year. The introduction of such hardy sorts as Champion, Alton, Illinois, Russell, Sea Eagle Improved, Washington, etc., has made it possible to profitably grow peaches where formerly it was supposed they could not be grown. Prof. Hedrick, of the Geneva, New York, Experiment Station, in a talk on "The Hardiness of the Peach," said: "This fruit has not yet reached its most northerly limit; culture and soil have much to do with hardiness. Trees from the South are not necessarily more tender than those from the North." In support of this statement one has but to recall the fact that Mr. J. H. Hale, the most noted peach grower in the world, has growing in the State of Connecticut immense peach orchards which have paid him very handsomely; fully as well as his orchards in Georgia.

Large peach trees are preferred by Mr. Hale for transplanting. He says: "As a general proposition I want a large peach tree, and plant lots of them from six to eight feet high. I used to try and make myself believe I wanted small trees, but experience has shown me that I do not. I cut the top off at a height of eighteen inches or two feet and remove the side branches. If only one bud puts forth it is apt to discourage the planter, but it should be allowed to grow. The next season cut it back, leaving three or four buds, and it will put forth shoots which will make a fine top for the low-headed tree. Yes, I want big peach trees, and know they are best for the general planter."

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EVERY GROWER SHOULD HAVE A COPY
*Roseburg, Oregon, Review*

The April issue of "Better Fruit," published at Hood River, Oregon, is a special spraying number, and contains a vast amount of valuable information for fruit growers. Among the special articles, all profusely illustrated, are: Orchard Plant Lice and Their Remedies; Methods for the Control of Codling Moth; Practical Experiments with Codling Moth; Some Recent Work on Bordeaux Mixture; Lime-Sulphur Spray Preventive of Apple Scab; Some Notions About the Spraying of Trees; bill introduced as substitute for Porter bill; Expense vs. Investment in Fruit Growing; Washington Agricultural College Spray Calendar. Every fruit grower should read "Better Fruit" regularly. Only one dollar per year for the best fruit paper in the world. Try it. You'll never regret it.

# PEACH GROWING IN THE PACIFIC NORTHWEST

BY PROFESSOR C. I. LEWIS, HORTICULTURIST, EXPERIMENT STATION OREGON AGRICULTURAL COLLEGE, CORVALLIS

I WOULD summarize peach growing in the Pacific Northwest under the following heads:

1. It has made a wonderful growth and its possibilities are great. Nature has given us more than our share of good peach land.

2. We have few peach specialists; consequently the industry has not yet reached the high commercial plane that the apple, the pear and possibly the cherry have attained.

3. Peaches are generally grown as a filler.

4. Very few side lines have been developed, such as canning, preserving, drying, etc.

5. The number of varieties grown is very limited. Few of the great California varieties are to be found, neither are many of the later Eastern and Southern varieties tested.

6. The occasional poor quality of our peaches is blamed to irrigation. This is a great mistake, as the finest types of peaches can be produced by irrigation. It is the ignorant or amateur irrigator who should receive the blame.

ASHLAND, OREGON, FANCY PEACHES

The above represents three grades of peaches packed at Ashland by the Ashland Fruit and Produce Association. The grades here represented are the "F," "A" and "B," the first containing from forty-four to sixty-four, the second from sixty-four to eighty, and the third from eighty to ninety peaches. The first grade, as can be seen, is in the box on the right, the next in the middle box, and the third in the box on the left. At the bottom are eleven peaches that measure a yard.

7. The peach is very often the first fruit produced by the amateur, thus being his first school for cultivation, irrigation and marketing. This accounts for some of the poor results obtained.

8. The peach is a very short-lived fruit in storage, its storage and shipping limit being about three weeks. This fact accounts for occasional poor prices and glut in the markets.

9. Peach orchards are often badly neglected in off years. This is a serious mistake.

10. Peach soils in general need more humus and nitrogen than is generally supplied to them.

11. The so-called short life of a tree is due to poor management, and principally along the lines of pruning.

12. Not enough study is given to the markets and methods of distribution. Every locality should study its adaptability for meeting a glut or an undersupply in the market.

Generally speaking, the peach prefers

MIKE HORAN ON RIGHT WILLIAM CROSSLEY, EXPORTER, NEXT, THE TWO PACKERS ON THE LEFT

a light, sandy loam. Many of the volcanic ash soils of the Inland Empire are ideal. In Southern Oregon we find that the granitic soils of the hills are the best, while in the region west of the Cascade mountains the sandy loams of the river bottoms should be selected. Occasionally the red-shot hill lands of the higher exposures of the valleys are good.

PICKING PEACHES IN THE ORCHARD OF GEORGE W. BOWMAN, PALISADE, COLORADO

The proper elevation at which to grow this crop is largely relative. In a general way the lower elevations are to be preferred, as they are apt to be earlier and nearer good shipping facilities. In the western part of Oregon we find that peaches should be grown either at the lower elevations or else at a fairly high elevation. That found in between is often more exposed and subject to frost.

The peach is an early bloomer and is therefore often caught by frosts that would not damage to any extent the apple or pear crop. One should avoid draws where cold air settles. In frosty regions the northern exposures are apt to be better than the southern. Large bodies of water, such as lakes or rivers, exert an influence. We notice this particularly in the case of the Columbia and Willamette, the regions in close proximity to these rivers being less frosty. Good air circulation is an essential of successful peach growing. The site should also be near good shipping facilities, as the peach is a very perishable crop.

Before planting the ground should be given thorough preparation, much as is practiced with other fruits. Occasionally peaches are grown successfully in Western Oregon on land that has not been entirely cleared, some of the stumps being allowed to remain to rot while the peach orchard comes into bearing. Probably the early spring months, such as March and April, are to be preferred for planting. Give your trees plenty of room. You want a broad, spreading tree instead of a tall, rangy one. Many growers who formerly planted 12x12 are now allowing 20 feet for the tree.

AN AVENUE IN THE APPLE ORCHARD OF F. M. BURGER, HALF A MILE WEST OF PALISADE, COLORADO

The budded one-year-old trees are to be preferred, as they adapt themselves to conditions more easily and give the grower a chance to start his trees low, with well formed heads. As regards variety, the number grown at the present time is rather limited. The Elberta is increasing in popularity. Other varieties grown are the early and late Crawfords, the Foster, Solway, Muir, Triumph, and a few of the clings, such as the Lemon and the Phillips. With the growth of the industry probably more of the yellow fleshed clingstones will be grown for canning purposes, while the

PHOTOGRAPH OF DR. J. H. DIVINE'S PEACH-PRUNING CREW, MARCH 5, 1908
In the background can be seen the famous Little Rock or Two Million Dollar Cliffs. They are situated on the north side of the valley and extend west for five miles. They are 2,000 feet high and nearly perpendicular. The heat from the sun is absorbed by the rocks. At night this heat is given off, and this, with the canyon breeze, furnishes perfect protection against spring frosts. The protection from these cliffs adds $2,000,000 to the value of land in the Palisade district.

yellow freestones are to be preferred for shipping. At the present time this experiment station is testing about one hundred varieties of peaches, and hopes to have something favorable to report in the future.

No one phase of peach culture is so neglected as the pruning. We must start with the one-year-old tree. This is generally topped at about fifteen inches from the ground and the head in some cases formed as low as eight or nine inches. The present tendency is toward lower heads. Vigorous trees that have not been exposed to hardship can be trained to a whip, but where there is some doubt as to their growth it is sometimes advisable to leave one or two buds on the small laterals. At the end of the first year it is advisable to select from three to five of the best branches, and remove all the remainder. Cut back these frame branches from ten to twenty inches, according to conditions. In the selection of these branches you should keep in mind that a broad-spreading tree is desired, and the pruning the first two seasons should be with this view in mind, coupled with the fact that you must also have strength if the tree is to bear large crops. After the framework is well formed the aim should be to develop as much strong bearing wood as possible. The fruit is always borne on the one-year-old wood. The fruiting wood at the lower and inside portions of the tree is liable to die out, unless care be taken to thin out where the growth becomes too heavy, and to head in somewhat to force out new lateral growth. Wherever trees tend to become too rangy head them back. This may be at the expense of some fruit, but the peach naturally tends to overbear. In years of no crop the peach grower has a fine opportunity to head back rangy trees and produce an abundance of wood for the next crop. Rather old trees that have been neglected can be rejuvenated by removing practically the whole of the top, cutting back the main branches to stubs, In two years a magnificent top can be developed.

Cultivation should be very thorough in the springtime. Where irrigation is not possible this intensive cultivation is generally necessary up to the time of maturity of the crop. There is a danger

YOUNG PEAR ORCHARD NEAR GRAND JUNCTION, COLORADO
A pear orchard in full bearing will net from $1,000 to $1,500 per acre in the Grand Valley of Colorado

at times in cultivating young trees and sometimes bearing trees too late into the fall, thus not allowing the trees properly to harden so as to ward off winter injury. With irrigation the same rule applies. A tree should never be allowed to suffer for water; at the same time the water should be so applied that for a period of three weeks during the maturity of the fruit no application of water will be necessary, as too much water at this time will result in a large, coarse peach which is watery and insipid and of poor shipping qualities.

One of the principal troubles the peach grower has to contend with is the peach leaf curl, and yet it is very simple to treat. The winter bordeaux, if applied just before the buds swell, will control this disease very easily. Some growers prefer using the lime-sulphur. Some complaints are received of California blight. Bordeaux mixture applied during November or December is said to be very effective. The peach borer is always with us and eternal vigilance is the watchword. It is probably best controlled by cutting out with a knife. Banking the trees with earth during the growing season is sometimes an aid. Poison sprays could probably be used, but the cost would be prohibitive. The peach worm at times becomes troublesome. A spraying with lime-sulphur or kerosene emulsion in early spring, at the time one sprays for the curl, will be effective. Many peach orchards would be benefited by a good winter clean-up spray with lime-sulphur solution.

PEACH ORCHARD OF KEELEY & DUBOIS AT UNDERWOOD, WASHINGTON

Just when to pick is a difficult question to answer, as growers differ in methods used for determining this condition. Size, color, condition of the fuzz, the tendency to spring beneath the thumb, are some of the signs used. The fruit should be handled very gently, as one must be absolutely sure not to cut or bruise in any way if the fruit is expected to carry well. Neat half-bushel baskets are used in the Ashland district, and they seem very satisfactory. I neglected to state that thinning is a very important item in peach culture. A premium is paid for the large sizes when well grown. This means that the fruit should be thinned to from four to six inches apart. Otherwise small and often worthless fruit is the result.

The so-called twenty-pound box is the one in common usage. It varies somewhat in depth, being 3½, 4, or 4½ inches in depth, making the total measurement when nailed, for the larger boxes, 5¼ inches. These boxes are 19¾ inches long and 10½ inches wide. All the better grades of peaches should be wrapped and box paper used to keep the fruit free from dust. The finer grades will stand box lithographs and lace paper, while the outside of the boxes should always bear the owner's lithograph. The grades vary somewhat in different localities. Personally, I like those used by the Ashland Fruit Growers' Association. The best grade is known as "Fancy" and contains from 40 to 64 peaches to the box. The second grade is known as "A" and contains from 64 to 80. The third grade is designated "B" and contains from 80 to 90 to the box. All fruit of these grades must be free from fungus, split pits and worms. The next grade is often known as the "Dago" and is sold unwrapped. Probably all grades below "B" should be sent to canning factories, evaporators, etc., and with the growth of the industry such factories will be established. However, few men would be willing to establish a factory for cull fruit only, and we will therefore probably have to grow some of the canning varieties.

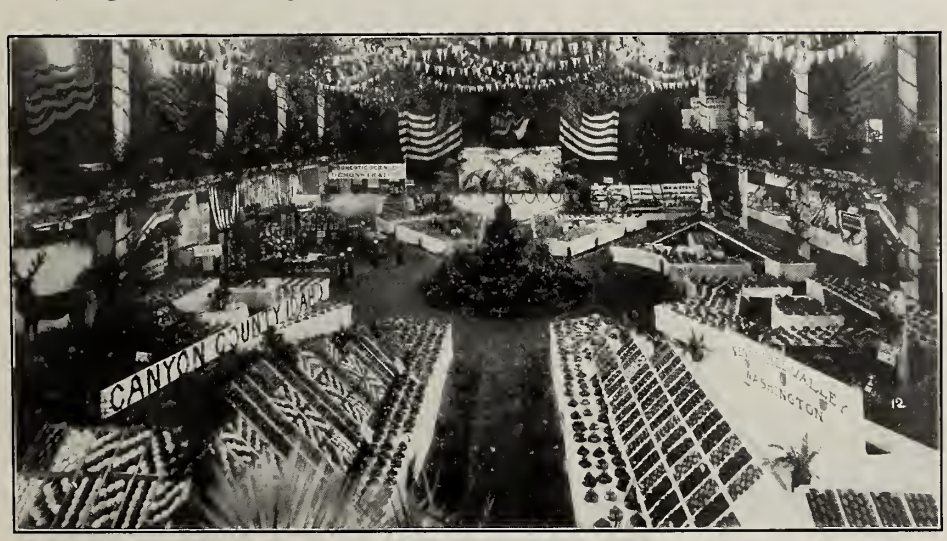
In the handling of this crop great care must be taken not to bruise or injure the fruit in any way. It must not be allowed to become heated after picking, and must be packed in the boxes so as not to rattle. One must avoid, however, too firm packing, as it will often cause large discolored spots to appear in the fruit soon after leaving storage. With the establishing of precooling and chilling plants many of the problems which concern peach handling will be solved.

CRAWFORD PEACHES GROWN AT ASHLAND, OREGON, BY J. N. RHINEHART

# PROPER PRUNING AND SHAPING OF PEACH TREES

BY J. H. DIVINE, PRESIDENT PEACH GROWERS UNION, PALISADE, COLORADO

BEFORE entering upon my subject, I would like to say a few words about the trees to be planted. They should be one year old and the best, largest and most perfect in root and trunk to be had. About ten per cent more than required to plant the orchard should be ordered, so that those not coming up to the highest standard may be thrown out. A few dollars saved by planting small and inferior trees may mean a loss of five hundred dollars per acre in the selling price when of bearing age. After the tree is planted it should be cut off at about the height of one's knee, leaving nothing but a stub; if there should be a limb on the tree cut it off close to the trunk, leaving not more than one bud on it. The pruning at the end of the first year is done mainly for the purpose of forming the frame of the future tree. Usually we find a number of sprouts growing on the stub and some coming from below the bud. From four to seven should be selected to form the head of the future tree; the rest, and all coming from below the bud, should be cut off. The branches may commence anywhere from a few inches above the ground to the top of the stub; they should be spaced as near equal distance around the body of the tree as possible. If, from any cause, the sprouts will not make a good head, one of them should be selected to make a new head and the rest cut off. If the sprout selected should stand off at an angle from the trunk, it may be tied to it by a strip of cloth. The sprouts selected to make the future top should be pruned and cut back. If the growth has been feeble, or if a good top cannot be formed, then the tree should be taken out and a new one planted in its place. The planter should be satisfied with nothing less than a perfect stand of first-class trees.




GRAND VIEW NATIONAL HORTICULTURAL CONGRESS, COUNCIL BLUFFS, IOWA DECEMBER, 1908
To be held at same place in 1909. Washington and Idaho exhibits prominent in foreground

THREE-YEAR-OLD PEACH TREE
In orchard of J. H. Carstens, North Yakima, Washington, that measures twelve feet six inches in diameter

The second year's pruning is done to shape the head of the tree. First cut off all limbs in the top of the tree well back, and as near on a level as can be done so as to cut off each limb just above a lateral limb; then cut out all limbs not wanted, leaving enough spurs and limbs to fill the inside of the tree and to protect the branches forming the framework or scaffold of the tree. If the trees have been planted far apart, the limbs on the outside of the tree may be left on and the tree spread so as to have a wide top; if planted close, then the limbs growing near the upright must be left on. The limbs left on the tree are usually tipped if small, or severely cut back if large, so as to induce branching. It sometimes happens at this age that some of the trees are not well balanced, having strong branches on one side and feeble ones or open spaces on the other. To rectify this trouble, some of the branches on the strong side of the tree may be sawed out, and limbs on the other side of the tree pointing toward the opening may be left and the branches cut down to them, and some of the limbs on the other side of the branch cut off, so as to induce stronger growth in the limb headed toward the open space. If this cannot be done, then the tree should be sawed off a little way above the bud, and one of the sprouts growing from it used to form a new head.

The third year's pruning is a continuation of the second. Cut the top well back. If any of the large limbs are too low down, so they are in the way of the implements used in cultivation, they must be removed. The tree may be allowed to bear a few peaches—one or two boxes to the tree. Some of the best twigs for bearing peaches may frequently be found low down on the branches and in the inside of the tree. Ordinarily they should be cut off, but may be cut back and allowed to bear and be removed at the next year's pruning. In the fourth year the tree should be in full bearing, and the pruning is now done for the double purpose of continuing to shape the tree and for fruit.

### Pruning a Tree in Full Bearing

There are as many styles of pruning trees as there are pruners—good, bad, indifferent and highly injurious. I have seen pruning done that I would not have done to my trees for a thousand dollars an acre. I will not attempt to describe

SALWAY PEACH TREE AT HOOD RIVER, OREGON, IN ORCHARD OF OSCAR VANDERBILT

faulty methods, but will try to describe the way I prefer to have my trees pruned. Always commence at the top of the tree, cut off the large limbs of last year's growth as far back as possible and as near on a level as can be done and still cut off just above a limb or limb bud. Select the strongest, most vigorous twigs of last year's growth to bear fruit, shorten them back to from six to twelve inches in length. Cut off close to the limb the small, less vigorous twigs and spurs and the other twigs that are too close or that interfere with those left to bear fruit. Leave a few of the most vigorous spurs and twigs on the body of the branches, just sufficient to protect them from the sun and to induce a strong growth, to enable them to hold up a heavy load. After the tree is pruned it should be slightly oval on the top—not flat like the top of a table. I do not like the way some growers have of thinning the fruit as they prune, or cutting off so much fruit-bearing twigs that but little thinning is required. In strong, vigorous trees an immense growth of wood is induced, the twigs bearing the fruit buds are up from two to four feet on the limbs, and if allowed to bear they are soon beyond the reach of a ladder. If the tree has made a feeble growth as the result of the butchery, or if the strong growth of the limbs are again cut off, the fruit is borne on the spurs and small twigs in the inside of the tree; in that case the load of fruit is less and the peaches smaller. The tree should be pruned to make it as perfect in shape as possible, leaving on enough of the strong twigs to bear fruit and supply twigs for next year's fruit, as well as to insure a good but not excessive growth of wood; then thin, and thin intelligently. There is no class of work we do in our work that pays us as well as it does to thin. We should all try to reach that happy medium that enables us to raise the largest crop of first class fruit and still keep our trees in good, healthy condition. I imagine we all prefer the large returns from fruit rather than to see who can show the largest brush pile. The trees should be kept in a healthy, vigorous condition, and that includes fertilizing, irrigating and cultivating, which is "another story," and does not come within the scope of a paper on pruning. Some growers prune late in the fall and at intervals during the winter when the weather will permit. I believe it to be a bad practice. If the weather be cold and dry, the twigs will not heal over, but will dry out below where they were cut off, leaving more or less dry stubs. The best time to prune is just when the buds are swelling. But when the grower has a large orchard he is compelled to commence pruning as soon as the weather will permit after the cold of winter has passed. After the trees have become old, or if from improper pruning they have grown beyond the reach of the ladder, they may be cut back to any place desired, even as low as three or four feet above the ground, and a fine new top grown on them.

LEMON CLING PEACHES, GROWN BY J. E. HARVEY AT ROSEBURG, OREGON

SCENE ALONG THE COURT OF HONOR, ALASKA-YUKON EXPOSITION, SEATTLE WASHINGTON, BEFORE THE OPENING DAY, JUNE 1, 1909

## PORTLAND ROSE SHOW AND A.-Y.-P. EXPOSITION

THE Alaska-Yukon-Pacific Exposition and the Oregon State Commission are making a strenuous effort to secure for Portland Day at the Seattle Fair all the floats that will be shown in the "Spirit of the Golden West" parade at the Rose Festival of June 9. This pageant will be one of the most beautiful features of the carnival, and will serve splendidly to exploit the wonderful resources of the Oregon Country, as each float, car or chariot will represent the matchless fruit and other products indigenous to the many important localities of the great Northwest country. It is proposed to make the parade in Seattle an exact replica of this particular parade as seen in Portland.

The floats are to be one of the chief attractions of the celebration which will be held in Seattle on "Oregon Day," July 17, and through an agreement between the exposition officials and the Oregon State Commission for the Seattle Fair, these twenty floats, representative of the industries and resources of the various communities of the state, will form the nucleus of the principal street demonstration which will take place on that occasion.

The Northern Pacific Railway, in response to a request from the A.-Y.-P.-E. officials, has agreed to haul these floats from Portland to Seattle and back again absolutely free of charge.

In addition to the plan to have these magnificent set pieces appear in "Oregon Day" parade, an arrangement has been made by the Rose Festival with the Oregon State Commission, whereby they will be photographed and reproduced on lantern slides and shown in the auditorium of the Oregon Building, together with a lecture on the resources of the communities represented. These lantern slides and lectures will afterwards be sent to the East and exploited throughout the East and Middle West.

TWO-YEAR-OLD PEACH ORCHARD AT HOOD RIVER, OREGON

# MUST THE CALYX CUP OF THE APPLE BE FILLED

BY M. V. SLINGERLAND, CORNELL UNIVERSITY

MORE than a decade has elapsed since I studied the codling moth and monographed the then existing knowledge of the insect in Bulletin 142 of the Cornell Agricultural Experiment Station. Since then I have closely followed the excellent work done, both in the East and Far West, by which much new information has been gleaned regarding the life history and methods of controlling this pest. But I was hardly prepared for the accusations that Eastern entomologists were lax and not up-to-date in their advice to their constituents, as set forth in the article entitled "Filling the Calyx Cup," in the June, 1908, number of this journal.

CELEBRATED PEACH ORCHARD OF GEORGE COOPER, THE DALLES, OREGON FAMOUS FOR FINE PEACHES

Fortunately I had been making some photographs of calyx ends of developing apples for my class work when the above article appeared. The pictures well illustrate the outer and inner calyx cavities, which are separated by the ring of stamens, with the large fleshy pistil extending up through the center. The bases of these stamens set very closely together and come up close around the pistil. I was also surprised to find that even after their tips had withered and the calyx lobes had closed in, the stamens remained fresh and plump at the base and around the pistil, and thus still formed a partition or wall between the two cavities. In fact, so tight a barrier did the stamens form between the two cavities that I became a "doubting Thomas" as regards the assertions of some entomologists that it was absolutely necessary to drench a tree with a spray sufficiently forceful to drive the poison into the lower calyx cavity in order to obtain satisfactory results against the codling moth.

After reading the assertive and accusing article above mentioned, on June 27, I went to nature for the facts as regards the feeding habits of the young codling moth larvae. Do they feed any in the upper calyx cavity after squeezing through between the closed calyx lobes? Or do they go on down through the closely set row of stamens into the lower calyx cavity for their first meals? The answer to these questions would determine if it was necessary to drive the poison spray into the lower calyx cavity.

I found that in every case where the young larvae had entered the apple at the calyx end it had stopped to feed in the outer calyx cavity. Furthermore, the larvae had fed in the outer cavity for several days, or through the first larval state. The only ones I found going farther into the apples had a head diameter of about .54 mm., which corresponds almost exactly to Simpson's recorded diameter for the head of codling moth larvae in the second stage. At D on the plate is shown such a larva in the second stage that was just going into the lower calyx cavity. It had fed quite extensively around in the upper cavity, partly on the fleshy stamens, and a few pellets of its excrement had dropped into the lower cavity. I was unable to obtain any evidence that the larvae worked their way into the lower calyx cavity without first taking several meals in the outer cavity. Several other Eastern entomologists with whom I have discussed these facts have made similar observations. The young codling moth larvae may have different feeding habits in recently set apples in the Far West, but thus far I have not seen any definite facts or pictures to prove that they do not first stop to feed in the outer calyx cavity when they enter young apples at this point.

Remarkable results have been recorded from thorough, drenching, forceful arsenate of lead sprays in the West; perhaps better results than Eastern fruit growers usually get; but is it not due more to thoroughness and method of application than to the two hundred pounds pressure which is supposed to be necessary to drive the spray into the lower calyx cavity? All entomologists and many progressive fruit growers now understand the great importance and necessity of the application of a poison spray for the codling moth soon after the petals have fallen and before the calyx lobes close up. But there still remain many apple growers who do not spray thoroughly enough or direct the spray properly into the calyx cups; and it is not because of the laxity of proper advice of entomologists. Such is human nature. Finally, from recent codling moth literature and from the facts I have been able to glean from nature, I am not yet convinced that it is wise to assert that a fruit grower must drench his trees with arsenate of lead only, and that the spray must be applied with a force necessary to drive it into the lower calyx cavity of young apples. The evidence submitted in Bulletin 131 of the Colorado Experiment Station to show that fruit trees are being poisoned and killed by excessive use of poison sprays should be seriously considered by both entomologists and fruit growers in alkaline regions. Under similar conditions cannot just as satisfactory results be obtained against the codling moth with either paris green or arsenate of lead applied as fine spray in moderate quantities evenly over the trees at about one hundred pounds pressure, if the spray is properly directed downward into the open outer calyx cavities of the recently set apples? I have not yet seen sufficient evidence to warrant entomologists in answering this question in the negative.

PEACH ORCHARD AND HOME OF GEORGE COOPER, FRUIT GROWER, THE DALLES, OREGON, WHOSE SPLENDID ARTICLE APPEARS IN THIS ISSUE

# SUGGESTIONS ON GROWING PEACHES FOR MARKET

BY GEORGE COOPER, THE DALLES, OREGON

THE suggestions offered in this article apply to The Dalles district, where fruit is grown without irrigation, and where the average annual rainfall is about 15 inches. In districts where the rainfall is greater or irrigation is used, these suggestions should be modified.

The selection of a suitable site for a peach orchard is of prime importance. The soil should be deep and loose, that the moisture from the winter snows and rains may be stored beneath the trees, and that the roots of the trees may easily reach down to that moisture. Under these conditions the lay of the land is not of great importance. A north slope is satisfactory for all varieties except the Salway, which, by reason of its ripening late in the season (October) is very deficient in color when grown on that slope. On a south slope the fruit ripens earlier, will have a little better color, but is likely to be smaller than that grown on a north slope. East and west slopes are about equally good, other conditions being similar. A tract of land that is protected from prevailing winds is most desirable.

In the selection of varieties the grower should be guided by the market he expects to reach. If it is his intention to sell to canneries, two or three varieties of best canning peaches are sufficient. If he expects to ship to distant markets in car lots, he should plant only best shipping varieties. But if he intends to reach some not very distant market he should plant varieties to cover the whole season from the earliest to the latest.

The trees should be planted about twenty-five feet apart, if the square plan is used, or twenty-seven or twenty-eight feet on the triangular plan.

If no crop is to be grown among the young trees I would advise planting in the fall, as a good stand of trees can be secured at that time with less effort. But if it is the desire of the orchardist to grow a crop of something else in his orchard the first year, then it is better to plant in the spring, for the land can be easier put in good condition before the trees are planted. If spring planting is decided upon, and the trees are found to be shriveled or in a low state of vitality, they can be greatly revived by standin them in a trench about eighteen inches deep, filling the trench about half full of water and filling up with soil, and allowing the trees to stand in the mud thus formed for a week or more. If trees are taken from this heeling place and hauled through the orchard in a barrel containing sufficient mud and water to cover the roots, and taken from the barrel and put into the ground immediately, with soil well packed around roots and body of trees, as good a stand can be secured with spring as with fall planting. About the time the trees begin growing they should be headed back to eighteen or twenty inches from the ground, that they may make low heads. At the end of the first season's growth the trees should be given their general shape by thinning out and cutting back the branches. While three main branches are enough for a grown tree, it is well at this time to leave from four to six, as it may be found that the trees will grow too heavy on one side, and this can be corrected only by cutting away large branches on the heavy side. This is almost sure to be necessary where trees are grown on land exposed to the prevailing winds.

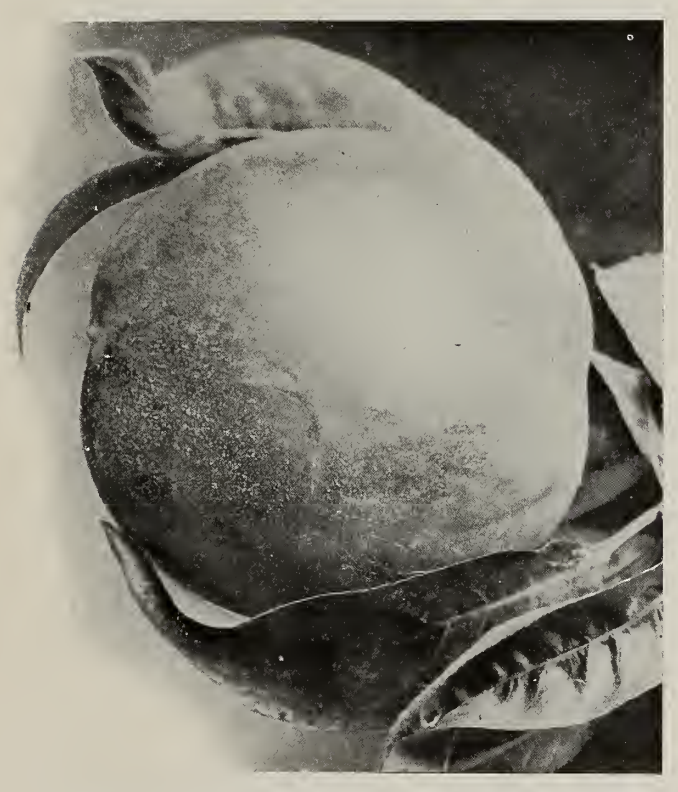
It will be found necessary at the end of each growing season to thin out and cut back the growth of the past year, and often some of the older wood; keeping always in mind the fact that it desir-

The "Smith's Royal" is the name given a new peach which has been developed in the Baker Valley and is creating a deal of comment and inquiry in local fruit circles here in Baker County, Oregon. It is a very handsome fruit, with coloring very pronounced and unusual, and while it is a fit ornament to grace the tables of the most exclusive, it is inferior to none as to flavor. The major reason for its local popularity is, however, that so far as known it is absolutely immune from the effects of spring frosts, which do such great damage to the more tender fruits throughout the United States. Here in Baker Valley, where the altitude is 3,400 feet above sea level, almost every variety of apple does well, and as a pear producer this valley will no doubt soon rank with the best. The fruit is of good size, and that great scourge to pear orchards, "blight," is unknown. But while most all fruits, both large and small, do well here, the peach, until this late discovery, has been an entire failure. The "Smith's Royal" has, however, so far withstood all tests and is loaded fairly to breaking with fruit every year, and this year will be planted quite extensively by the Baker Irrigation Company. In form the "Smith's Royal" is almost globular, and in size a little above the average, many measuring nine to ten inches in circumference. Its color is a very delicate yellow, gradually changing to a rich reddish purple. The coloring of this peach is so vivid and is in such marked contrast to other market varieties that it attracts and holds attention. The flesh is also of a delicate yellow, juicy but very firm. The flavor is hard to describe; it is not sweet, nor is it extremely acid, but rather a blending of the two, but it does have a very pronounced "tang" that is a most pleasant surprise to all who eat them. We also have here a new apple, which is being freely planted, and which bids fair to become the standard in this climate. It is a large, handsome fruit of excellent flavor and surpasses every known variety as a keeper; with ordinary care keeping until August or Septembr. It has many of the characteristics of the Newtown Pippin, but is much larger. It is generally a three and one-half tier apple. In color it is a light yellow, tinged with green, and has a very pronounced red cheek. This apple has in a small way gone into the markets, alone and unknown, and readily sold at from $2.50 to $5.00 per box, which makes growers here confident that with this climate, and with this new apple, they can hold their own with the world in the production of high class apples that keep.—C. E. Linthacum, Baker City, Oregon

DISPLAY OF PEACHES GROWN IN ASOTIN COUNTY, WASHINGTON, EXHIBITED AT THE LEWISTON AND CLARKSTON FAIR

able to keep the head low and the shape symmetrical. When the trees come into bearing they should be pruned for the purpose of producing high grade fruit, as it is better to have a tree produce eight boxes of fancy peaches than to have it produce sixteen boxes of "C" grade peaches. All branches growing toward the center should be removed, and outside branches should be thinned out and cut back, so as to allow the sunshine to pass freely through the tree.

In places where the peach worm is troublesome, the orchard should be thoroughly sprayed with the lime and sulphur solution just before blooming. If this work is carefully done the loss from peach worms will not be worthy of mention. Lime and sulphur solution is also of some benefit in keeping down peach leaf curl, and under some conditions is all that is needed. But under conditions favorable to the growth of this fungus the lime and sulphur solution is not so efficient a preventive as the bordeaux mixture. Cold, backward weather in the spring is productive of curl leaf. Fortunately this pest is bad on only a few varieties, among the worst of which is the Elberta.



THE STANWICK NECTARINE
Originated in England from seed brought from Syria, and it is no exaggeration to say that it is the best nectarine in existence today. Very large, almost globular, often as large as a peach; skin pale, greenish-white, shaded into deep rich violet in the sun; flesh white, tender, juicy, rich, sugary and delicious. Will average fully two one-half inches in diameter. For drying and shipping it is not excelled by any other variety. August and September.

The orchard should be cultivated as early in the spring as the ground is dry enough to work. Deep cultivation is not necessary or advisable, but the surface of the ground to a depth of three to four inches should be thoroughly pulverized and kept loose throughout the season, to act as a mulch to prevent the escape of moisture by evaporation.

When the young peaches are about as large as a canary bird's egg the grower should begin thinning the fruit, saving the best specimens and thinning out to one peach to each six inches of the bearing wood. This general rule, however, should be varied a little according to the size of the branch being thinned. The largest branches being able to mature high grade fruit even as close as one peach to four inches, while on the smallest branches they should be more than six inches apart. If it is a commercial orchard that is being thinned, by the time the late varieties are reached a part of the crew should begin re-thinning the early varieties, for the purpose of thinning any branches that may have been missed by the workers when going over the trees the first time. These second thinners should be persons who have keen eyesight and take a lively interest in their work, for it is important that this work be thoroughly done. Any peaches that pass these workers without being thinned are likely to be of little or no value.

When the peach crop has developed to that point where it is time to begin marketing the fruit, the grower having done his part well in the process of production and nature having supplied the balance, a good crop is ready for the reaper. At this point, if the fruit is to be shipped, more care and skill must be used than at any other time in the peach business. The fruit must be picked at the right time, graded properly and well packed, or all the good work that has been done will be depreciated and the result will be unsatisfactory to the grower, the dealer and the consumer. But if this work is properly done, good returns will more than repay the grower for all the energy expended in bringing about the desired results. The peaches should be matured but not soft when picked. It is difficult for the inexperienced picker to distinguish between those that are ready and those that are not quite ready for picking. But care and patience will soon overcome this difficulty.

The system of grading and marking now in use in this district has given general satisfaction for the past two or three years. The peaches are separated into five grades, according to size, and packed and marked as follows. Those packing 4x7 or better are marked "Fancy." Those packing 4x8, "AA." Those packing 4x9 and 5x8, "A." Those packing 5x9, "B." Any that are smaller are marked, "C." In an orchard that is well cared for there will be very few "C" grade peaches. The difference between the selling price of one grade and the next grade is usually ten cents per box. Therefore,, while "C" grade peaches are only paying expenses, "fancys" will be netting the grower a good profit.

THE ALAMEDA HEMSKIRKE APRICOT
Of English origin, it strongly resembles the Moorpark, but ripens earlier and is a more regular and prolific bearer. Fruit large, roundish, but considerably compressed or flattened on both sides. Flesh is a bright orange, tender, with a rich plum-like flavor. Ripens very uniformly. A great favorite. Late June.

Last, but not least, in the process of growing peaches for market, is the packing. The peaches should be wrapped and carefully but firmly placed in boxes of a depth to suit the size of the fruit. The cover of the box, when nailed on, should touch but not press upon the fruit. The peaches should be placed in the box so firmly that if the box is stood upon its side or end the fruit will not settle.

THE JEFFERSON PLUM
Large, oval, greenish-yellow, becoming rich golden yellow, dotted and flushed with red. One of the best for canning; one of the most desirable and beautiful of all dessert plums. Parts freely from the stone; tree a good grower and very productive July to September.

# STORAGE OF FRUIT WITHOUT LOSS OF FLAVOR

By MR. TUFF, DETROIT, MICHIGAN

THE question of cold storage is quite an extensive one—too extensive, I think, to tax you with any great portion of it. It has been known for quite a long time—'way back in ancient history. It is only in the last twenty-five or thirty years that it has been commercially perfect.

I have had considerable experience in the mountain regions and from the lower regions of Maryland with peaches, and I find that three weeks is just about the safe time for storage of peaches; and that the keeping of them for that length of time depends on how they are picked, placed in the cars and handled for transportation. If the shipper will guarantee me that he will get them in from from three to six o'clock in the morning and shut the car up and give me the temperature of the car when it leaves the point of shipment, give me the number of tiers, we can come mighty near delivering them in three weeks in perfect condition. A customer comes in and demands an order for fifty baskets. If we did not know just how long each lot would keep we would lose, for we might send out fifty baskets at that time that would keep ten days longer in good shape. By that means you will get them out in better shape. If you keep them longer than three weeks—I have seen them gotten out in four weeks looking perfect—they would say that the meat of the peach was gone after getting down to the stone. Next to the Bartlett pear, the peach is one of the most delicate things that we handle. Do not speculate on keeping them more than three or four weeks at the outside. Most of our peaches come from Maryland, Georgia and Michigan.

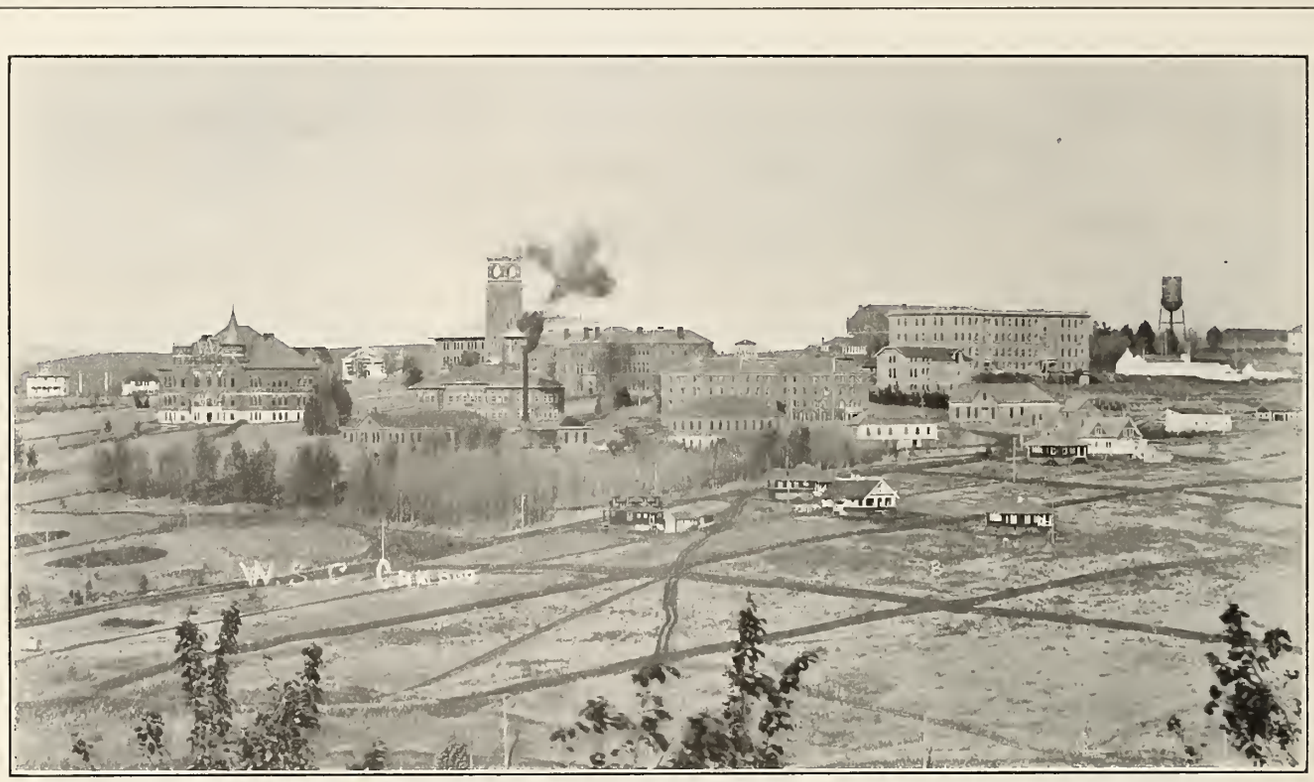
Regarding the grape storage with us, we have had very little trouble with grapes. We do not keep them over two to four weeks at the longest, and our temperature for both peaches and grapes is thirty-three to thirty-five degrees.

If the Bartlett pear is picked and given to me eighty per cent ripe, in our section, we can keep them two months, but if they are full ripe and have any color, two weeks. The temperature used is thirty-three degrees.

Apples, which are our principal storage fruit, we hold altogether on the condition they come in. This year they came in two weeks over ripe. We had to hold them twenty-nine or thirty days. We give them thirty degrees through the season. Western people store their apples in a package; ours in a barrel. Have the package so packed that it is impossible in the transportation for it to shake so that it would cause a bruise. Now we have had this season and last season—over fourteen months in the house—apples that are now commercially perfect to such an extent that for four weeks I kept samples on my desk to hand to callers to test. They were cushioned at the bottom of the barrel, and they were so packed that it was impossible for the apples to move in transporting them.

How to pack grapes. I will have to refer that to some one who knows more about it. We never have any trouble at all in thirty-three degrees temperature. We keep them from three to four weeks.

The packing of apples is essential to the correct keep-



CAMPUS, WASHINGTON STATE AGRICULTURAL COLLEGE, PULLMAN

GRAND VALLEY, COLORADO, PEACHES

ing of them. No question about that. I have no trouble with apples when they give them to me about eighty to eighty-five per cent ripe, and I have seen them color as nicely in the storage as I have outside. Apples will ripen faster on the ground than they will on the tree. The sooner you can get them into a cool place after packing the better, because we cannot make poor apples good. We can only take the ripening and hold it there. Ours is simply the care of the apples.

We store them four high in barrels, on two by fours from the floor, so that circulation would be all right. We put them five high in a room if eleven-foot ceiling, so that we have plenty of circulation at the bottom and all we want at the top.

In placing apples for long storage, what precautions are necessary in packing? Absolute care and vigilance in packing to get them out of the orchard.

The next question is, about what percentage of the apple crop is stored in the United States? That would be a very hard question to answer. I have never seen any statistics on it. I would say that about sixty per cent of the crop is stored.

### As to Refrigeration

The question is asked, What class of refrigeration is best? There are two or three modes of refrigeration. Expansion and absorption are the economical methods of refrigeration. I have had to deal with two of the latter, one indirect, that is, where the air is cooled at a certain point in the building and blown to the rooms, giving just the temperature necessary for the goods stored. Calcium brine will stand forty-five degrees below zero. These breaths of air are blown at possibly seven degrees below zero and from there to the room, and it gets to the room about five degrees below zero; in some rooms less than it leaves the surface. For eggs we would want about thirty-one degrees. That is what we call indirect. It is the same system as a furnace. The Weil is the last and the best mode.

Direct refrigeration is where the pipes are built in the side or on the ceiling. Direct ammonia or brine at certain temperatures are used, and they extract the heat from the room, so that the humidity of the room cannot be governed as well as where the indirect system is used. The percentage of success in the one and the other is about the same. The idea that anyone in the cold storage business can keep peaches two months and have them come out commercially perfect I doubt. I have never seen it done in twelve years' experience. The great benefit that we get from cold storage is the protection that the owner has in holding the markets. In exporting you cannot get along without it. Cooled here in a storage house, with a reasonably low temperature on board ship, there is no question about its arriving at destination in perfect order.

COLLEGE FARM, PULLMAN, WASHINGTON

ADMINISTRATION BUILDING, SCIENCE HALL, AND GIRLS' DORMITORY, WASHINGTON STATE AGRICULTURAL COLLEGE, PULLMAN

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AMONG new peaches, the Sims Cling certainly merits the attention of intending planters, as clearly indicated in the colored frontispiece we give. This new candidate for horticultural honors possesses a rich golden color with handsome blush to the sunny side. In size and physical characteristics it much resembles Phillips' Cling, but in flavor and grain of flesh (especially when canned) it much surpasses that popular variety, being larger, almost round, flesh deep yellow to the pit, of fine texture and firm.

Experience with Sims Cling on the part of the canneries only gives emphasis to its surpassing qualities as a canning peach. The Griffin & Skelly Company of Fresno, who have thoroughly tested it in this respect, say that "The fruit is of fine texture, rich color and excellent flavor. It seems to ripen between Orange Cling and the Phillips, which is certainly an added advantage in the operation of our cannery. We shall welcome the day when a sufficient quantity of these peaches is available for canning purposes. If we were planting today we should certainly put out a considerable acreage to this new variety."

Sims Cling trees are being introduced in commercial quantities this season by the Fancher Creek Nurseries of Fresno, California, who have on hand the only available supply.

# FRUIT SHOW HELD AT COUNCIL BLUFFS, IOWA

THE apple exhibit at the National Horticultural Congress at Council Bluffs, Iowa, was in every way creditable, and it is intended to make the organization a permanent one, the exhibit to be held at various places in the country. The meeting next year will be held the third week in November, and the exhibit will include all kinds of fruits. The 1909 meeting will be held in Council Bluffs again, and several cities already have extended invitations for the 1910 meeting.

The exhibits at Council Bluffs were made principally from the states of Iowa, Maryland, Washington, Idaho and Colorado. The shortage of the apple crop throughout the Middle West prevented a display from that section.

The first prize for best state exhibit went to Iowa. In making up the premium list the management thought to get exhibits of all kinds of fruits, and therefore included all fruits in deciding which was the best state exhibit. The Western states sent nothing but apples, while Iowa had grapes, peaches, pears and nuts, and Maryland had a splendid exhibit of nuts in addition to apples. Second premiums went to Idaho and third to Maryland. The premiums for plate exhibits were distributed among the various states represented, Wenatchee, Washington, carrying off more, perhaps, than any other locality. The Brother Jonathan trophy for the best barrel or three boxes of Jonathan apples went to Mr. Chapman, of Wenatchee, Washington.

In connection with the fruit exhibits there were exhibits of vegetables and some splendid exhibits of flowers, the latter adding much to the attractiveness of the display. A lecturer from the domestic science department of the Iowa Agricultural College talked to visitors regarding the various ways to serve apples as food, and in their presence prepared many of the dishes which were described. A short program had been arranged for each day, and there were a number of addresses on various horticultural topics. This will be continued next year. The exhibit of spraying appliances was good and Professor Bliss of the Iowa Agricultural College called attention to the various machines every day. Each machine was operated by some person representing the manufacturer, and Professor Bliss conducted a class of visitors around, that they might see the good points of all styles of outfits.

On the last day of the show a meeting of the various officers and state vice presidents was held, and it was decided to make the show for 1909 in every way greater than the one for 1908. It was decided to hold the exhibit the third week in November. Coming earlier in the season, this will permit exhibits of other fruits than apples, and a splendid showing should be made of pears, prunes, peaches and grapes.

At the show next year it is expected to have a program that will discuss the problems of commercial fruit growers, with speakers from all parts of the country. The organization is to be national in its scope, and its meetings will be held in various parts of the country. W. S. Keeline of Council Bluffs is president for 1909, and Captain J. H. Shawhan of Payette, Idaho, is vice president. G. W. Reye of Council Bluffs continues as the secretary and treasurer.

A concert was given every afternoon and evening by a splendid band, and music was one of the features of the show. So well pleased were the people of Council Bluffs with the show and its educational advantages that the county commissioners appropriated $1,000 to help along the good work, and it was money well spent. Utah's exhibit, in charge of Messrs. Northrop, Taylor and Titus, won first premium for artistic display, and this exhibit also won first premium for evaporated fruits and nuts. A feature of this exhibit was the display of trophies won by Utah fruits at other exhibits, including the magnificent sweepstakes cup won at the National Irrigation Congress in 1908. Dr. A. E. Miller, of Austin, Colorado, and other growers from that state promised that Colorado will be represented by several carloads of fruit next year. Idaho, Utah and Washington made the same promise, and with a good fruit crop throughout the Middle West the local exhibits will be many times greater than they were last year. The principal premiums next year will be in the form of silver cups, etc. Plate premiums, of course, will be paid in cash, but most of the exhibitors asked that the trophies be given instead of cash for the state and district displays. They want a permanent form of premium.

Our traveling representative, C. R. Greisen, after attending the meeting of the State Horticultural Society of Oregon in Portland for one week, and one week at Spokane at the National Apple Show held in December of last year, went direct to the National Horticultural Congress held at Council Bluffs.

NEW AUDITORIUM AND LIBRARY BUILDING
Washington State Agricultural College, Pullman

NEW DOMESTIC ECONOMY BUILDING
VAN DOREN HALL
Washington State Agricultural College, Pullman

NEW COLLEGE HALL
Washington State Agricultural College, Pullman

NEW ARCH
Washington State Agricultural College, Pullman

# MONEY BEING MADE IN GROWING CRANBERRIES

BY NORMAN J. MYER, PORTLAND, OREGON

ALL economic plants show a preference for certain soils and climatic conditions, and none are more exacting in this regard than the cranberry. The conditions necessary for success in cranberry culture are soil of a peaty or alluvial nature and provided with an ample water supply and an easily available supply of sand. Repeated failures have resulted from attempts to establish cranberry plantations on soil not congenial to the plant. The best index to the fitness of the soil from this crop is the occurrence of native cranberry plants. Where the cranberry is indigenous to the soil it is safe to undertake the commercial cultivation of the crop. The commercial cranberry bog or meadow should combine as many as possible of the elements which characterize the natural habitat of the plant. While the cranberry is not a water plant, it thrives best on soil in which the water level is within a few inches of the surface.

Nature has been most bounteous in bestowing upon that section of Tillamook County, Oregon, known as Sand Lake all the elements which characterize the natural habitat of the cranberry, the soil of this section being a pure peat with an average depth of four feet, which is underlaid by a firm clean sand, with an inexhaustible and easily available supply of clean beach sand and an ample supply of fresh water for flooding the meadows when desired. Our meadows, lying level as they do, make it possible with very little expense to maintain any desired water level. In addition to all of the other favorable conditions bestowed by nature, she has seen fit to cause to grow native cranberry plants which yield prolifically.

The first step in preparing a cranberry bog or meadow is to eradicate all bushes and tree growth. Following this all surface vegetation should be removed. This operation, called turfing, consists in removing the top layer of the soil to the depth of from two to four inches, according to the character of the vegetation, the object being to cut deep enough to destroy the crowns and roots of all plants which might prove troublesome as weeds in the cranberry plantation. After the surface of the area to be planted has been brought to the desired grade and the surface soil given a thorough cultivation and again compacted, the area is ready for sanding. This operation consists of covering the area to be planted to a depth of three to four inches with a coating of sand free from clay and seed of obnoxious weeds. As the subsequent cost of caring for the meadow is largely determined by the care in sanding, the operation is of more importance than would at first appear. Because of the boggy nature of the land usually selected for the cranberry meadow, this work must be done by hand. It should be done under the supervision of a man skilled in cranberry culture, which will insure the marshes being prepared in the best possible manner. After the marshes have been prepared and the slips planted, the marshes are left for nature to do her work, it only being necessary to keep the water in the ditches at the proper level, which is a very simple matter. The second year after the slips are set out there is a light yield of from 100 to 200 bushels an acre. The third year it is usual, if the marsh has had proper attention, to secure a full crop of from 500 to 800 bushels per acre, which yield will be maintained from the first setting for a period of from twenty-five to thirty years. It is not uncommon for the first full crop to pay all the expense of purchasing, preparing and setting out the marsh.

PICKING CRANBERRIES BY HAND AT SAND LAKE

Cranberry culture is one of the most profitable departments of agriculture. Oregon cranberry culture is especially so, owing to the premium of fifty per cent to seventy per cent that Sand Lake berries command in the open market. Still another reason is the fact that while the demand for cranberries is constantly increasing, the land that can be utilized for growing cranberries is very limited. Cranberry land cannot be made artificially, and there are only 25,000 acres of cranberry land in the United States.

Quoting the New York price for cranberries, which is far below the market price for the Oregon fruit, the lowest figure ever reached was in 1879, when they were sold at $1.15 to $1.35 per bushel. From that they gradually increased until 1895, when they were $4.65 per bushel. The average price for Eastern berries has been from $2.65 to $3.35 per bushel. As against this, the produce merchants state that the average price for Tillamook cranberries for the year 1907 was from $3.35 to $4.00 per bushel.

Cranberries are prolific producers and require little or no care. A gentleman who is owner of a bog south of Tillamook County, states in a newspaper article that he cleared two thousand dollars from five and one-half acres for several successive seasons.

A banker of Tillamook County states: "We have one-fourth acre in cultivation. It has been planted eight years and without care or attention produced last year 650 gallons of first-class cranberries, said by grocers to be the finest berries ever seen here, averaging 390 bushels to the acre."

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SOMEBODY, some day, somewhere, may publish a better fruit paper than "Better Fruit." Nothing doing just now.

GRADING CRANBERRIES AT SAND LAKE, OREGON

PICKING CRANBERRIES WITH SCOOPS AT SAND LAKE, OREGON

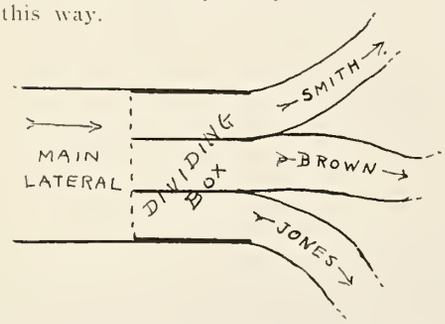
# MEASURING AND DIVIDING WATER FOR IRRIGATION

BY PROFESSOR EDWARD B. HOUSE, COLORADO EXPERIMENT STATION

MANY of our irrigating ditches are associated enterprises, built and owned by the people owning land watered by them. Each farmer is therefore entitled to a certain share of the water running into the ditch, or he owns a certain number of "rights" in the ditch regardless of the amount of water running. For instance, suppose there are one hundred shares in the ditch and a person owns two shares. He would then be entitled to one-fiftieth of the water in the ditch. When the ditch is full, this may amount to several second feet, and when the water is low it may amount to only a part of a second foot.

The devices used to divide this water are many and varied in design. Some are good, some bad and some indifferent. Again, several farmers may run their water through one lateral until it reaches a point near their farms, when it is divided and each part goes to their respective farms through a separate ditch. This should always be done where the water is carried any distance, for the "seepage" is much less in one large ditch than in a number of small ditches running side by side. The amount of water lost by "seepage" through the bottom and sides of a ditch is considerable. In some of our Colorado ditches it amounts to seventy-five per cent, and only one-fourth of the water entering the head-gate ever reaches the fields. This, however, is excessive; the average ditch loses from twenty to thirty per cent in seepage. A broad, shallow ditch will lose much more water than a narrow and deeper one carrying the same amount of water. The bottom of a ditch is not by any means watertight, and it is like running water over a fine sieve, and, of course, the larger the surface of the sieve the more water will it pass.

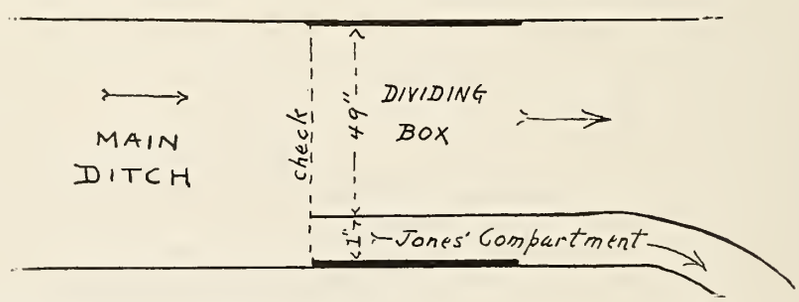
Suppose we have three farmers taking water through the same lateral. They bring it down to a certain point and then attempt to divide it equally. In this section of the country many of them do it this way.




A dividing box is placed in the main lateral; in this box is placed two dividing boards, equally spaced. Smith's water comes from one side; Jones gets his from the other; and Brown takes the center third.

My advice to farmers is this: Do not go into a deal of this kind. If, however, your neighbors insist upon it and outvote you, like the man in the insane asylum when met by a friend and accosted like this: "Hello, Bill! how in the world did you get in here?" replied, "Well, you see, I thought everyone else was crazy and everyone else thought I was crazy, and they outvoted me." So, if your neighbors outvote you and it is a two to one proposition, then just say: "All right, gentlemen, if you insist upon it, I'll go in with you, but I insist upon being Brown and getting the middle third." You can all see why. The veloeity of the water is greatest in the center, if the ditch is running straight, for it is retarded by the weeds, grass, pebbles and dirt at the sides of the ditch, and hence more water passes into and through the middle section than into the side sections. Of course, if the box is put in on a curve, then the greatest velocity is near the outside of the curve, and the one owning this section would have the advantage. But, says someone, make the section having the larger velocity smaller. This can be done, but no rule can be given for it, because the relative velocities in the cross-section will differ with the condition of the ditch and will also be different when the ditch is running full from the same ditch half full.

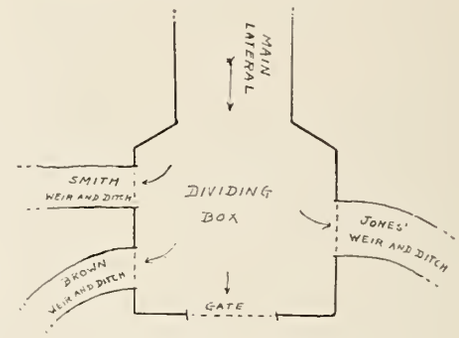
On the main ditches, here is a scheme worked out many times—




Suppose there are one hundred shares in the ditch and Jones owns two shares. A box is put in, the water is checked up and falls over the check into two compartments. Say the box is fifty inches wide, then Jones's compartment should be one inch wide, and the other forty-nine inches. Hence Jones gets one-fiftieth of the amount flowing. Does he? He does not, because of the smaller velocity at the sides. It is, however, a much better scheme than the former one, for the check increases the cross-section of the ditch above; the water approaches the check much slower than it otherwise would, and the side and center velocities are much nearer equal. Another disadvantage is the narrowness of Jones's compartment, for a stick or a toad or a few leaves may lodge there and effectually dam it.

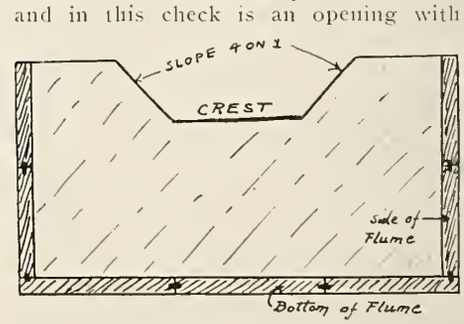
Another thing. In the majority of cases the ditch is allowed to fill up above the check, until the bottom coincides with the top of the check, and in this case much of the advantage of the check is lost. The thing for a farmer to do is to see to it that the ditch is kept cleaned out above the check, and if the check is put in at the head of the box, see to it that the side next to his compartment is kept clear of weeds and grass.

A scheme that I think would work well would be as follows:




Take the case of Smith, Jones and Brown again. Let the ditch come down as before, and instead of dividing boards put in a box like this. The gate at the bottom end can be raised when desired to flush out the box. Put trapezoidal weirs at the sides of the box. Place them all on the same level and let the water spill out into the respective ditches. If the amounts are to be equal, make the weirs the same size. If Jones should get double the amount Smith should, he is entitled to make his weir double the length of Smith's. Keep the box clean and each will get his just share.

This trapezoidal weir, or Cippoletti weir is an invention of Mr. Cippoletti, an Italian engineer who built one of the large canals in Italy, and devised this means of measuring water. It consists of a check in an ordinary box or flume and in this check is an opening with




horizontal base or crest and sloping sides, through which the water flows. The sides are given a slope of 4 on 1.

The formula worked out by Mr. Cippoletti for the discharge over this weir is: $Q = 3.36\ lh\ 3/2$ or $Q = 3.36\ lh\ \sqrt{h}$, where (l) is the length of the crest in feet and (h) is the head flowing over the weir. The head (h) should always be measured some distance above the check. This can be done by fastening a stake to the side of the flume and some dis-

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Hood River, Oregon

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# *The* KURTZ Fruit Dryer

Simplest, cheapest and best dryer in use in Oregon, Washington and California. Tunnel system, best system on earth. We build by contract or furnish plans and patent rights and material, wire cloth, cast iron furnaces and furnace pipes. We also manufacture the Kurtz Prune Dipping and Spreading Machine. It has no equal; saves its cost in less than one season; capacity 200 to 250 trays per hour. Write for descriptive circulars and prices

CLINTON J. KURTZ

SALEM, OREGON


tance above the weir, the top of the stake being on a level with the crest of the weir, and the depth of the water is measured at this point. Later experiments have shown that Cippoletti's coefficient 3.36 is a little too large and 3.33 is probably nearer right, and hence the formula will be $Q = 3.33\ lh\sqrt{h}$. This will give the quantity flowing in second feet, provided both (l) and (h) are measured in feet.

To put this formula into words, as a rule, we will have the following: Rule to calculate the quantity of water flowing over a Cippoletti weir—Take the length of the crest in feet, multiply it by the head flowing over the weir measured in feet; multiply this product by the square root of the head, and then multiply the last product by 3.33. This will give the quantity in second feet.

For example: Take a weir 2 feet long and the head flowing over it to be .64 feet; $2 \times .64 = 1.28$. The square root of .64 feet is .8 feet. Therefore, $1.28 \times .8 = 1.024$ and $1.024 \times 3.33 = 3.409$ second feet, which is the quantity flowing in this case.

The rules for constructing the weir are as follows, and they are very important if your results are to be accurate:

1. The distance from the bottom of the flume to the crest of the weir should be at least three times the head (in the above case, 1.92 feet).

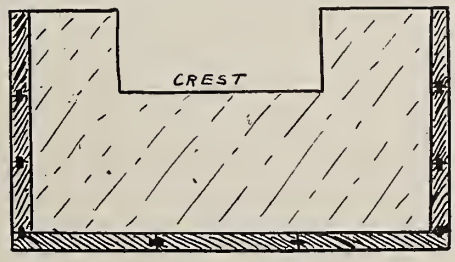
2. The distance from the side of the flume out to the crest should be at least double the head (in the above case, 1.28 feet).

3. The crest and sides should be leveled on the downstream side.

These rules should be followed in order that the cross-section of the ditch above the weir may be large; the water is brought practically to a standstill before it falls over the weir, and velocity of approach is avoided.

Water can be divided by this means in any desired proportion by making the length of the weirs proportional; for, let the length of one weir be 1 and the length of another weir be 1′, then the quantity flowing in the first case is $Q = 3.33\ 1h\ 3/2$, and in the second case $Q' = 3.33\ 1'h\ 3/2$. Dividing these two equations we will have, $Q : Q' :: 1 : 1'$; or the quantities flowing are proportional to the length of the weir.

Another weir in common use is the rectangular weir. This is the same as the Cippoletti weir in every respect, except that the sides stand perpendicular.




In this weir we must allow for end contractions of the water, and the formula generally used is Francis' formula: $Q = 3.33\ (l - .2h)\ h\sqrt{h}$.

Here the length of the crest is diminished by .2h on account of the contraction or cutting-in of the stream as it flows over the weir.

The above formula was worked out by Francis, an American engineer connected with the mills at Lowell, Massachusetts. These mills bought water for power, and it was important for them to have a contrivance with which water could be accurately measured. Backed by these companies, Francis took up the task of determining the weir formula. The care with which he went about this work and the precautions he took against errors, has given us a series of experiments and the resulting formula which are classics in hydraulics.

By using the formulae given both for the Cippoletti weir and the rectangular weir and following the rules for construction of the same, then with careful measurements of length of crest and head of water flowing, results may be expected in which the error will not be greater than one per cent, and this is very close work for ditch measurement.

Note—The next article will take up the measurement of water by means of the water meter, the rating of the meter, the rating of flume, etc.

◈ ◈ ◈

## HOOD RIVER'S ACTIVITIES

*With apologies to "Old Grimes" and "Hoo-Hoo."*

Now old Cyrus Noble was a happy old soul,
Yes, a happy old soul was he,
He was just loco, that's all, when he started to tell
Of his greatest apple tree.

"'Twould grow on mountain peak," said he,
"Yes, on the cold North Pole;
Even in Sahara's desert wild
And where the billows roll.

"Bed posts 'twill make that never will break,
Also telegraph poles that wear;
Why, man, 'f I owned the earth,
I'd plant them everywhere."

Then out spoke Greely, brave and cold,
Said he, "I know a land
That's never owned to date
By any mortal hand."

"Yes, I think I have an idea,
'Twould do to make me rich.
That blamed North Pole I'll find or bust
My clothes at every stitch."

So he built a boat and named it "The Choat,"
'Twould root the icy seas;
And went up North, where the wind holds forth;
Yes, and the icebergs freeze.

He carried a ton of apple seed.
"This," said he, "will do."
He took a spade to plant the seed,
An ax the logs to hew.

"Up there they'll grow like weeds, to fill the needs
Of man and woman and child.
The world will see what I can do
Upon the icebergs wild."

Away he went to find the Pole
(They're hunting for it yet);
We know he'll soon have money to burn;
He has a good safe bet.

Poor old Cyrus Noble, the good dear soul,
He's dreaming of the day
When he can make the apple tree grow
Along the Celestial Way.

You bet he'll show the angels how
He did things here below,
And how upon the very Milky Way
His apple trees would grow.

Or perhaps, and this looks easier still,
He'll take a little turn,
And show the devil how in h——
His apple trees as fuel would burn.

Our Ted's going to Afric's clime to hunt
(So the sportys say),
But the truth is this, he goes to plant
Sahara's desert way.

Poor old Cyrus Noble swears up hill and down,
And says the prize he'll land;
He'll surely make the apple grow
Upon the bescorching sand.

And Wilbur Wright, that airy sprite,
Plans to stake out the sky,
To plant the apple 'round the stars,
Yes, everywhere on high.

Finally now, you'uns may see the reason for
Hood River's activities;
They're all designing a place to find
To plant these apple trees.

—Albert J. Capron.

# BETTER FRUIT

HOOD RIVER, OREGON

OFFICIAL ORGAN OF
THE NORTHWEST FRUIT GROWERS' ASSOCIATION

A MONTHLY ILLUSTRATED MAGAZINE
PUBLISHED IN THE INTEREST OF UP-TO-DATE
FRUIT GROWING AND MARKETING

ALL COMMUNICATIONS SHOULD BE ADDRESSED AND
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E. H. SHEPARD — EDITOR AND PUBLISHER
C. R. GREISEN — TRAVELING REPRESENTATIVE

SUBSCRIPTION PRICE $1.00 PER YEAR
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ADVERTISING RATES ON APPLICATION

*Entered as second-class matter December 27, 1906, at the post office at Hood River, Oregon, under act of Congress of March 3, 1879.*


DISEASES OF THE PEACH, by A. L. Quaintance, of the Department of Agriculture, Washington, D. C., in this issue, is recommended to every peach grower, and we suggest that it be read very carefully and studied very thoroughly. The government is trying to assist every farmer and fruit grower in every way possible. In connection with the different states it assists in maintaining a great many experiment stations. The work of all the experiment stations finally reaches the head department at Washington, D. C., where it is given the most thorough kind of a trial. If their experimental work proves correct beyond any doubt, it finally becomes adopted and sanctioned by the Agricultural Department. Experimental station work does not always claim that their results are final, but where the Agricultural Department recommends a method it can generally be accepted by the reader as being the best established method known at that time.

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THROUGH the courtesy of the Fancher Creek Nursery, Fresno, California, we are showing on the cover page of "Better Fruit" an illustration of the Sims Cling peach. The description given by the Fancher Creek Nursery is so intelligent, thorough and brief that it is impossible for us to improve on it, consequently we quote from them, giving their description of the Sims Cling: "We consider ourselves extremely fortunate in being first to offer this magnificent peach. Our attention was first called to this variety by the well known fruit grower, A. C. Kuhn, and buds were forwarded to us from the original tree by Mr. W. A. Sims, on whose place it originated from a chance seedling. Its merits became more impressed on our minds after seeing it canned. The fruit was firm, with a rich golden color, and the flavor surpassed anything in the canned fruit line that has ever come under our observation. Possesses all the merits of the Phillips Cling without any of its faults. Fruit large to very large, almost perfectly round, skin golden yellow, with a faint blush on one side; flesh deep yellow, of very fine texture, firm and rich, with excellent flavor and clear yellow to the pit, which is quite small. The canning qualities of this peach have been fully determined by several years of actual trial, and we regard it as the very best clingstone for canning in existence today, and recommend that it be extensively planted." The following statement from the Griffin & Skelley Company, one of the prominent canning and dried fruit firms in California, bears out our statements as to the commercial value of this peach, for which we predict a great future:

San Francisco, California, October 6, 1908.
*Mr. George C. Roeding, President Fancher Creek Nurseries, Fresno, California.*

Dear Sir: Regarding the Sims Cling peaches, samples of which were delivered to our cannery at Fresno, will say we packed these samples and are most favorably impressed with them. We find the peaches to be of fine texture, rich color and particularly fine flavor, and the best late cling peach that we have ever had in our cannery. They seem to ripen between the Orange Cling peaches and the Phillips, and there has been an urgent demand for clings that would come in just at that time, as it would enable canners to materially increase their output of cling peaches, and we shall welcome the day when a sufficient quantity of these peaches is available for canning purposes. If we were planting today, we should certainly put out a considerable quantity of these clings. Yours truly,
Griffin & Skelley Company.

The Phillips Cling peach referred to in the above article is known as the best canning peach among the trade in the State of California and has been and is a general favorite. In connection with "Better Fruit" it affords the editor great pleasure to say that the Phillips Cling was originated by Mr. Joseph Phillips, a Scotchman, who died about a year ago at the ripe old age of eighty years, at Marysville, California. Mr. Phillips in the early fifties was a nurseryman for the editor's father in a large orchard owned by him at Marysville. Mr. Phillips afterwards planted and set several large orchards, the last one in Sutter County, which is four miles below Marysville, consisting of four hundred acres of solid orchard. The Phillips Cling is an excellent peach. The introducers of the Sims Cling claim it is a better peach for canning. We hope so. We certainly have great faith in it on account of the confidence we have in any statement made by the Fancher Creek Nursery.

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BETTER FRUIT with this edition completes its third year, which, by the way, is just two years and six months longer than the allotted time for its existence. The size of the paper has increased from 24 to an average of 60 pages. Our staff has increased from one lone editor and publisher to a staff of five, who are loyal, energetic, competent and able. The salary of every assistant has been voluntarily increased every six months. Our subscription list has grown from one subscription in July, 1906, to 8,013. Our edition has increased so that we publish 10,000 copies per month. Our advertising has increased from eight pages to thirty. "Better Fruit" has grown bigger and better every month. Why? Because it is our ambition to publish the best fruit growers' paper in the world, and we believe we are doing it; to make it the handsomest, regardless of expense, as far as our means will permit. The creation and publication of "Better Fruit" was and is a matter of pride. If it makes money, we can use it to advantage. If it keeps even we can stand it and won't kick. We are not busted yet, and we don't expect to be, all of which is very gratifying to us, and we believe that you, our subscribers and advertisers, who have helped us to make "Better Fruit," will have as much interest in this brief account of our wonderful success as we. The Northwest is young in the fruit business, compared with the East, and it must certainly be very gratifying to fruit growers of the Northwest to have the honor of publishing the best fruit growers' paper in the world.

◇ ◇ ◇

THE CLASS PAPER.—The class paper is a feature of the times. Most of them are edited and published by men who have no practical knowledge of the special line on which their paper endeavors to give information. Editors, journalists and printers were quick to realize the demand for special information on different classes of business and consequently were the first to jump into the publishing business, and the result is that there are now being published hundreds of class papers devoted to all lines of business. Some are good; some are not.

These people, understanding the newspaper business, appreciate the value of


**Willamette Valley Fruit Lands**

in tracts to suit. Rich soil, delightful climate. For descriptive literature write

OLMSTED LAND CO., Salem, Oregon

**Stranahan & Clark**

DEALERS IN

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GOLD MEDAL

Highest award on Tile at Lewis and Clark Fair

Tile From 3 to 12 Inch

Order carload lots or for further particulars write for booklet or call on or address

J. E. MURPHY

Fairgrounds Post Office, Oregon

advertising. The favorite stunt has been to start a class paper regardless of whether the publisher knew anything about this particular class of business or not. The first aim is usually to get up a big subscription list. This means lots of advertising. Advertising pays big if you have the circulation. Every one knows that the quickest way to get this circulation is to give a premium to the farmer. The publisher wants your subscription because it gets advertising. It is this that he is after, not your money. Your money he will get from the advertiser. He knows the human weakness of man and woman, and consequently he gives a premium, a fountain pen, a picture, a pruning shear, or a fruit tree. He will get you most every time. Sorry to say it. If the premium doesn't get you it will get your wife or the urchin. The publisher figures he is giving you your money's worth in the premium. Sometimes he does. Sometimes the premium isn't worth a cent. It may be a fountain pen that won't work. That makes no particular difference as long as your name is on the subscription list. You have got your premium. What else do you expect. If you don't expect much else you won't be disappointed. Frequently no effort is made to give you information of value as reading matter. Very few fruit growers' papers are edited or published by men who have ever been in the fruit business. Seldom any of them are edited or published by men who at the present time are engaged in growing fruit or ever expect to be, consequently you cannot expect them to be able to give you information of any great value about fruit growing or marketing fruit. There is one paper that doesn't give you a premium. There is one paper that does not want your subscription unless the subscriber takes the paper for the value of the information it contains. There is one paper whose aim is to assist you. There is one paper which is edited and published by a man who was raised in an orchard. There is one paper conducted by a man who understands the commercial side of selling fruit because he has managed the association in Hood River for five years. There is one paper that is edited and published, owned and controlled entirely by a man actively engaged in growing fruit at the present time. That paper is "Better Fruit."

◈ ◈ ◈

OUR INCREASE IN ADVERTISING.—July, 1906, in the first issue, we had 8 pages. December was 13 pages. Average for the year, 10 pages.

January, 1907, we had 13 pages. December had 23 pages. Average for the year, 23 pages.

January, 1908, we had 23 pages. December had 25 pages. Average for the year, 25 pages.

January, 1909, we had 27 pages. May had 30 pages. Average for the year to date, 30 pages.

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IN THE Marathon race, the hundred-yard dash, the human race, the fellow that wins is the man who gets there. With the fruit grower the race is for yield and price. It is quality that wins every time. If you want to know how to produce quality you must adopt modern methods and be progressive. There is just one journal that is Johnny-on-the-spot all the time with this class of information. We don't have to tell you. You know it is "Better Fruit."

◈ ◈ ◈

GROWTH OF "BETTER FRUIT"
Subscriptions Taken Monthly to Date

| | 1906 | 1907 | 1908 | 1909 |
|---|---|---|---|---|
| January | ... | 205 | 257 | 900 |
| February | ... | 151 | 340 | 720 |
| March | ... | 103 | 425 | 608 |
| April | ... | 250 | 265 | 403 |
| May | ... | 240 | 300 | ... |
| June | ... | 260 | 220 | ... |
| July | 102 | 250 | 235 | ... |
| August | 163 | 330 | 300 | ... |
| September | 130 | 302 | 420 | ... |
| October | 92 | 351 | 430 | ... |
| November | 160 | 210 | 400 | ... |
| December | 99 | 341 | 900 | ... |
| Total | 746 | 2993 | 4972 | 2631 |

FROM the initial number of "Better Fruit," June, 1906, our aim has been quality. The best of everything. Articles, paper, illustrations and printing. The result is that today "Better Fruit" is recognized as the best fruit growers' paper, the handsomest fruit growers' paper, the most reliable fruit growers' paper, the most influential fruit growers' paper published in the wide, wide world.

◈ ◈ ◈

MR. M. HORAN, of Wenatchee, writes a very interesting letter to "Better Fruit," in which he says the public schools have instituted horticultural courses which are proving very interesting and instructive. The idea has proven practical in the Wenatchee district, according to the personal opinion of Mr. Horan. He states that the class on pruning came down to his orchard and pruned a number of trees, which they did in a very excellent manner. Many of the students who had taken a course in packing at the school took up the line of work during the busy packing season, and did their work in fine shape. Now all of this is very interesting and very significant. In the first place, by teaching horticulture in the schools it creates an idea in the mind of the child that horticulture is a high calling and a matter of education, and not pure farm labor work. This is an excellent idea to instill in the youthful mind. Mr. Horan calls attention to another point which is worthy of consideration. The help question is apt to be a problem with us. If we can educate our children in this line of work and make them interested it will mean that we will have well trained, efficient help right in our own midst to assist in harvesting the big crop of fruit that will be grown in all of the splendid fruit districts of the Northwest. Mr. Horan never overlooks very much and he also calls our attention to the fact that giving the youngsters a knowledge of the fruit business in their school courses means giving them an opportunity to earn good money for themselves after school hours and during summer vacations. It is certainly a good deal better for the child to make him earn money than to give it to him, and the ideas suggested by Mr. Horan's letter are very valuable and the benefit is so clear that it hardly seems necessary to more than suggest it to the public schools in the different districts, through the columns of "Better Fruit," to insure its being adopted. Times are really very different nowadays than they

J. GRANGER & CO.
LINCOLN, NEBRASKA
Wholesale Fruit Merchants
Largest receivers and distributers of Western apples, strawberries, raspberries and blackberries in Nebraska. Send us your shipments. We will get you the highest market prices and remit promptly.
Correspondence Cheerfully Answered
References: Corn Exchange National Bank, Chicago; Chatham National Bank, New York City; First National Bank, Lincoln, Nebraska; Richey & Gilbert Company, Toppenish, Washington; Yakima County Horticultural Union, North Yakima, Washington

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*Wholesale Fruit and Produce and General Commission Merchants*
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CONSIGNMENTS
Are Solicited, all Your Shipments Receiving our Personal Attention

Do You Know Us?
We have been in the WHOLESALE FRUIT business in Seattle for seventeen years, and are doing business with customers from all over this Western country. Write us today. Our market is the leading one in this country.
Gordon & Company
*805-7 Western Avenue, Seattle, Wash.*

Sgobel & Day
*235-238 West St., New York*
An old, good and reliable fruit firm. Handlers of all kinds of
Fancy Fruit
*Large Exporters of Apples*
CORRESPONDENCE SOLICITED


WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

were when most of us were boys. The editor calls to mind the fact that his idea in getting an education was to fit himself so he could live in a city and do business in a city instead of being a farmer. The times have changed and the boy who grows up in the country now educates himself to return to the farm, with the idea in mind that by being educated he can do the work better and consequently increase the profits.

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ABOUT OURSELVES.—"Better Fruit" gets results for its advertisers. "Better Fruit" is the best fruit growers' paper printed in the English language, the handsomest horticultural paper printed in America. It does not publish an advertisement of any questionable line of business. It does not knowingly publish any advertisement of any firm that is unreliable, consequently the readers of "Better Fruit" have confidence in all its advertisements. A class paper is the strongest advertising medium in the world, because every subscriber is a possible customer. The handsomer the publication the stronger will be its pulling capacity for business.

A fruit paper printed on ordinary paper goes to the waste basket. "Better Fruit" is never found in the waste basket. A class paper that is valuable to the fruit grower for information contained is always preserved. The reading matter in "Better Fruit" is composed of common sense, technical and scientific articles of inestimable value to the fruit grower, consequently as an advertising medium its value is unlimited.

"Better Fruit" does not give a single premium for subscribers. Therefore every subscriber of "Better Fruit" takes the paper for the value of its information, consequently every subscriber is interested in the paper and its advertisements.

The subscription list April 1 was 8,013, and has been built up on merit, and today "Better Fruit" has subscribers in every state and territory in the Union, every province in Canada and seventeen foreign countries.

An advertiser must spend his money if he wants to get most for his money in a publication that reaches a class of trade with which he does business. This is common horse sense. If you have any dealings with the fruit grower an advertisement in "Better Fruit" will get you greater results than any other publication in the Northwest, because every one of our subscribers is interested in your business. One of our advertisers placed an advertisement in "Better Fruit" with its 10,000 circulation and placed the same advertisements in a popular magazine with 200,000 circulation, and reports over 200 times the results coming from "Better Fruit."

We could tell you of many more, but a word to the wise is sufficient. One good illustration is sufficient, and we believe we have said enough to convince any business man who has goods to sell to the fruit grower that "Better Fruit" is the best advertising medium in existence.

Fruit growers are prosperous people. They want the best of everything and have the money to pay for it.

## J. W. GODWIN & CO.

**COMMISSION MERCHANTS, SEATTLE, WASH.**

MR. J. W. GODWIN, who is at the head of this firm, was doing a commission business in Seattle under the firm name of J. W. Godwin & Co. during the years of 1891 to 1903 inclusive, and at that time sold one of the largest and best commission houses in this city. He has now associated with him Mr. E. A. Wanamaker and Mr. F. C. Bloxom, both of whom have been a success as salesmen in commission houses on Western

J. W. GODWIN

Avenue for the past six or seven years. We have been operating since the first of March, and are doing a successful business. Our location, experience and facilities for handling fruit and produce on commission is second to none in the city. We respectfully solicit your consignments. Please correspond with us before making your arrangements for shipping your fruit this season. We would be glad to furnish shippers with rubber stamps on application.

◈ ◈ ◈

Almost the whole world knows of Hood River as a place that produces the best fruits, and all of Hood River Valley should know, and could know, that there is one place in Hood River, under the firm name of R. B. Bragg & Co., that the people can depend on getting the most reliable dry goods, clothing, shoes and groceries at the most reasonable prices that are possible; try it.

The
Lawrence - Hensley
Fruit Co.
*Successors to*
THE LIEBHARDT FRUIT CO.
Jobbers of
Fruits and Vegetables
and Apple Packers
**Denver, Colorado**

*Things we are Agents for*
KNOX HATS
ALFRED BENJAMIN & CO.'S CLOTHING
DR. JAEGER UNDERWEAR
DR. DEIMEL LINEN MESH UNDERWEAR
DENT'S & FOWNES' GLOVES
BUFFUM & PENDLETON
311 Morrison Street, Portland, Oregon

*The* PARIS FAIR
*Hood River's Largest and Best Store*
DRY GOODS
SHOES, CLOTHING
We are offering some extra specials in our Clothing Department. Ask to see them
Try a pair of American Lady $3 & $3.50 Shoes or American Gentlemen $3.50 & $4

OLDEST LIVERY COMPANY IN THE VALLEY
TRANSFER & LIVERY CO.
Special Attention to Commercial Men, Camping & Fishing Parties
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HOOD RIVER, OREGON

A Trip to the Coast
Is incomplete without a ride on the
Mt. Hood Railroad
By Mountain Streams, Apple Orchards
Virgin Forests and Snow Capped Peaks
Connects with O. R. & N. at Hood River, Oregon

Apples are about out of season
And so are game and celery,
But that is no good reason
For not buying a Revised Economy,
The code that is up to date
And used in every state
On Berries, Grapes and Greens,
Cucumbers, Cant's and Beans,
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In straight and mixed car lots.

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For Oregon and Washington

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Hood River, Oregon

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EYES TESTED LENSES GROUND

Over 30 Years' Experience

TELESCOPES, FIELD GLASSES
MAGNIFIERS TO EXAMINE SCALE

HOOD RIVER, OREGON
AND GLENWOOD, IOWA

The
Hall Drug Store

EASTMAN KODAKS AND SUPPLIES
Souvenirs, Postcards, Stationery
PYROGRAPHY MATERIALS

*Hood River's Largest and Best Drug Store*

Cupid Flour

Has same standing in the Flour Trade that Hood River Apples have in the Fruit Trade. *Made by*

HOOD RIVER
MILLING CO.



## THE KIMBALL HARROW

THE orchardist of today is probably the most modern and progressive tiller of the soil. He wants the best of everything and is constantly on the lookout to find it. There is no man who will discard a good implement, when he finds a better one, quicker than will the orchardist. He probably appreciates a thorough tillage, putting the soil in perfect tilth, more than any class of farmers. He understands that to produce a vigorous tree and good quality of fruit he must have the soil in perfect condition. He must cultivate so as to conserve every particle of moisture possible, and during the growing period he realizes the importance of clean cultivation, that is, keeping the soil free from weeds. There are all kinds of tools for doing this. The first cultivation is easily done with a plow or disc harrow. A spike-tooth or a spring-tooth harrow is used afterwards for stirring and breaking up the soil more thoroughly, and until recently these tools have completed the average cultivation for the time, but within the last few years a number of patent harrows have been put on the market for the purpose of putting the soil in a finer condition and creating the perfect dust mulch. This dust mulch acts as a blanket. This blanket accomplishes two purposes. First, it draws the moisture from away down deep in the ground up to where the roots can get it, and secondly, the dust blanket prevents the moisture from escaping.

There are many patent cultivators used, but none more successful in doing this than the Kimball cultivator. The knife of the Kimball cultivator has a peculiarly shaped curve, so that it stirs the soil and at the same time it pulverizes it, and the peculiar curve and angle of the knives is such that no tool can be more effective than the Kimball cultivator. Hundreds of growers are discarding their old tools and using the Kimball. This is made in three widths, so as to suit all distances of planting. It is made in extension so as to reach clear up to the trunk under the bearing tree, while the horses travel far enough away from the tree so as not to brush it.

One trial of the Kimball is sufficient to convince any up-to-date orchardist that there is nothing better. Mr. R. H. Weber, of the firm of Johnstone & Weber, The Dalles, who is both a practical nurseryman and orchardist, has used this machine in his orchards for some time. He knows what it is and realizes that there will be an immense demand for them, which means a big business, consequently he has associated himself with Mr. Johnstone in taking the agency for them. This firm is aware of the fact that the fruit grower wants a good thing and knows it when he sees it. They are sold at a very reasonable figure, and further information and circulars can be secured by addressing the firm, Johnstone & Weber, The Dalles. Mention "Better Fruit" when writing this firm.

"Better Fruit" knows this to be a good tool; nothing better.

◈ ◈ ◈

### A HOME CANNING OUTFIT

SURPLUS VEGETABLES AND FRUITS EASILY MADE TO SHOW SATISFACTORY PROFIT

Growers of fruits and vegetables often find themselves with a surplus which they cannot sell. The market may be overstocked or the prices poor, but whatever be the cause, the extra supply must either be unloaded very quickly or represent a total loss.

With the ever-increasing demand for canned foods of every description, the solution of the question becomes very easy indeed. A home canning outfit for taking care of the farm products that cannot be sold will prove itself a splendid investment in nearly every case.

Such equipment need not be costly or elaborate, and splendid profits are assured.

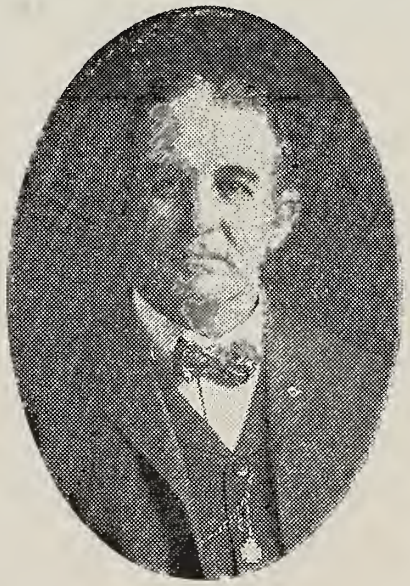
Probably the best home canning outfit now on the market is the "Stahl." This machine is thoroughly well constructed, is easily operated and is reasonable in price. The manufacturers claim that no experience is necessary and that the directions given are sufficient to operate it successfully, the truth of which appears to be sustained by the fact that thousands of Stahl outfits are in satisfactory service all over the country.

At any rate, canning seems to be the most profitable way to dispose of surplus farm and garden produce, and the F. S. Stahl Manufacturing Company, makers of the Stahl canning outfits, whose address is Box 304D, Quincy, Illinois, will be pleased to send literature and answer inquiries upon this subject.

### PIONEER SEED HOUSE CELEBRATES

THE CHAS. H. LILLY COMPANY, ON THE DATE OF THEIR TWENTIETH ANNIVERSARY, HAVE AN INFORMAL GATHERING OF EMPLOYES AND STOCKHOLDERS.

Many expressions of good will and congratulations were showered upon the Chas. H. Lilly Company last week when they celebrated their twentieth anniversary. Mr. C. H. Lilly, the president of the concern, whose picture is shown, made appropriate remarks, as did many other heads of the numerous departments.



CHARLES H. LILLY

Mr. Frank Leckenby, vice president and manager of the seed department, commented upon the fact that the Department of Agriculture had been largely instrumental in the development of the seed business and successful farming, making it difficult for unreliable dealers to exist for any length of time. Besides the tests made of the Chas. H. Lilly Company's seeds by the Department of Agriculture at Washington, they themselves made private tests, and it was this precautionary measure that was largely instrumental in the building up of their large and successful business. He mentioned, too, the tendency among farmers to use commercial fertilizers, which was an indication of more economical and therefore more successful farming.

Many others of the firm made remarks and quite a few compliments were paid the men who had built up the poultry food factory to its present state of efficiency and output.

Plans were discussed whereby the firm is planning to have a large exhibit at the A. Y. P. Fair, to show the world at large that the newer West is capable of holding its own against the older East.

CAPITAL STOCK $100,000 SURPLUS $20,000

FIRST NATIONAL BANK

HOOD RIVER, OREGON

F. S. STANLEY, *President*
E. L. SMITH, *Vice President*
E. O. BLANCHAR, *Cashier*
V. C. BROCK, *Assistant Cashier*

ASSETS OVER $325,000

*Savings Bank in connection*

## REPORT OF NORTH YAKIMA GROWERS' UNION

PACKAGES of fruit of all kinds handled by the Horticultural Union last year were a total of 264,920. This was an increase from 170,415 in 1907 and from 86,270 in 1906. The value of the business, financially, in 1908 was $180,060 as compared with $201,723 in 1907, when the prices prevailing were considerably higher. The increase of 90,000 packages handled in the past year, however, is the mark of the increase in business. As between consigned and purchased packages the figures show that in 1907 62 per cent of the business was consigned and of the much larger business of 1908 55 per cent was consigned. The consignment business of 1908 was, in itself, 37 per cent greater than that of the preceding year.

As an illustration of the increase of business in some of the leading fruits the reports showed packages of apples shipped in 1908 to number 124,541, as compared with 41,000 in 1906, and 60,000 in 1907; pears were 18,668, as against 7,700 in 1906; peaches were 55,278, as against 15,000 in 1906; plums and prunes 42,377, as against 14,000 in 1906. Grapes, which were 3,500 packages in 1906, were 16,000 in 1907, but in 1908, which was a bad year, fell to 12,208. This is the only fruit crop which showed a decrease. Two years ago the Union handled, in the winter months, two cars of potatoes. Last year it handled 25 cars, and the past winter 33 cars.

In its statement of resources the Board of Trustees showed the Union to possess real estate of the value of $25,000; fixtures worth $1,000; treasury stock worth $17,280; merchandise of a value of $3,762.36; apples and potatoes worth $2,727.20; accounts receivable, $12,179.69, and cash, $3,241.56. This makes a total of $65,231.67. The capital stock is $40,000, the amount due shippers is $7,987.28; the accounts payable, $6,559.72; bills payable, including a mortgage on the building, $4,500.

The foregoing report, which was made by W. N. Irish, secretary, the manager of the union, E. E. Samson, being in Vancouver on business, was received with approval, and on motion of Rev. A. H. Henry an informal resolution was passed declaring faith in the trustees and assuring them that in the opinion of the stockholders they have well and truly managed the interests intrusted to them.

Approximately 1,600 shares of stock out of a total of 2,272 issued were represented at the meeting.

W. N. Irish reported that the trustees, having in mind reports that purchased and consigned fruits come into competition with each other, said that he had examined into a number of shipments of mixed lots of fruit. These had gone to various stations and had been sold at the same time and invariably the same prices had been procured for the consigned as for the purchased fruit. Moreover, he declared that he had made it a special point to look into the facts regarding a carload of peaches, the low prices on which had caused some complaint.

Trustees chosen were as follows: For one-year term, Messrs. W. N. Irish, W. N. Nelson and M. N. Richards; for two-year term, Messrs. E. G. Peck and O. K. Conant; for three-year term, Messrs. W. M. Richards and Edward Remy.

The proposition was made today that the shares be divided up on a basis, say of ten to a shareholder. The large stockholders offered, one after another, to let go all but ten shares each and their separate announcements were received with applause. Minority stockholders offered to buy. W. N. Irish presented a well thought out plan of distribution on a ten-share basis. The plan is being put into operation.

Chas. G. Pratt, *President*
J. H. Osborne, *Vice-Preident*
R. W. Pratt, *Cashier*
M. M. Hill
Wilson Fike
C. H. Stranahan

Hood River Banking & Trust Co.

HOOD RIVER, OREGON

We own and occupy the finest equipped and most modern bank in Hood River County. A general banking and trust business transacted. Safe deposit boxes. Interest paid on time and savings deposits. Make our bank your headquarters when in Hood River. Correspondence and your patronage solicited

LADD & TILTON BANK

*ESTABLISHED 1859 Oldest Bank on the Pacific Coast*

PORTLAND, OREGON

Capital Fully Paid $1,000,000
Surplus and Undivided Profits $500,000

*Officers:*

W. M. Ladd, *President*
Edward Cookingham, *Vice President*
W. H. Dunckley, *Cashier*
R. S. Howard, Jr., *Assistant Cashier*
J. W. Ladd, *Assistant Cashier*
Walter M. Cook, *Assistant Cashier*

*INTEREST PAID ON TIME DEPOSITS AND SAVINGS ACCOUNTS*

Accounts of banks, firms, corporations and individuals solicited. Travelers' checks for sale and drafts issued available in all countries of Europe.

LESLIE BUTLER, President
J. N. TEAL, Vice President
TRUMAN BUTLER, Cashier

Established 1900
Incorporated 1905

Butler Banking Company

HOOD RIVER, OREGON

Capital Fully Paid $50,000 Surplus and Profits are $20,000

We give special attention to GOOD FARM LOANS

If you have money to loan we will find you good Real Estate security or if you want to borrow we can place your application in good hands and we make no charge for this service

J. M. Schmeltzer, *Secretary*

Hood River Abstract Company

Hood River, Oregon

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DID YOU GET YOUR COPY?

If not we will mail you our handsome

SOUVENIR BOOK
Of
STOCK FRUIT CASE

LABELS

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PORTLAND, ORE.

Write Us Today
Our Supply
Is Limited

## GRADING LIST OF THE GRAND JUNCTION UNION

### Peaches

Extra—Boxes containing 80 peaches or less. 90's—Boxes containing 81 to 94 peaches. 108's—Boxes containing 95 to 108 peaches. All grades must be free from worms, all other defects, and a tight pack.

### Apples

Fancy—Winesap, Grimes Golden, Missouri Pippin, Red Romanite, Geniton and kindred varieties must be two and one-fourth (2¼) inches in diameter and up. Boxes of Missouri Pippins and Winesap must not contain to exceed 15 per cent of 2¼-inch apples; 85 per cent must be larger. Jonathans, Arkansas Black, Ben Davis, Gano, Willow Twig, Shackleford, Pearmain, Mammoth Black Twig, Rome Beauty, White Winter Pippin, Mann, Tallman Sweet, Dominie, McIntosh, Wealthy, Steele's Red, Lawver, Baldwin, Huntsman, Spy, Minkler, Stark, Smith Cider, Walbridge, Pewaukee, Imperial, etc., two and one-half inches (2½) in diameter and up. Absolutely free from worms and other defects. Bright and normal color. Shapely in form.

Choice—Should not be less than two and one-fourth (2¼) inches in diameter and reasonably free from worms. In other words stock only a little below fancy. Throw away your trash; it won't

HENS THAT LAY IN WINTER
AS WELL AS SUMMER IS WHAT YOU WANT

I am selling a limited number of settings from my Special Pen of SINGLE COMB RHODE ISLAND REDS. These birds have been prolific layers through December, January, and February. $2.50 for FIFTEEN EGGS

Wm. B. Dyer, Calamus Lodge, Hood River, Oregon

Hood River Nurseries
Have for the coming season a very complete line of

NURSERY STOCK

Newtown & Spitzenberg propagated from selected bearing trees. Make no mistake but start your orchard right. Plant generation trees. Hood River (Clark Seedling) strawberry plants in quantities to suit.

SEND FOR PRICES

Rawson & Stanton, Hood River, Oregon

Buy and Try

WHITE RIVER FLOUR

MAKES

WHITER, LIGHTER BREAD

Apple Seedlings
NUMBER FOUR

*Two Fifty Per Thousand*

APPLE GRAFTS PIECE ROOTS
*Order quick*

FOREIGN FRUIT TREE STOCKS
*Cherry, Plum and Pear*

CONCORD GRAPES — *One and Two Year*

CHERRY TREES—*All Grades*
*A Large General Stock*

*Submit List for Prices*

Shenandoah Nurseries
D. S. Lake, *Proprietor* SHENANDOAH, IOWA

1909 100 pages of most interesting information about Flowers, Vegetables, Bulbs, Field Seeds, Grains, Grasses, Plants, Shrubs, Garden Supplies, Poultry Supplies, Fertilizers, Sprays Twenty years experience in seeding the Pacific Northwest speaks to you in this our very latest

PORTLAND SEED CO

SEED CATALOGUE

CULTURAL DIRECTIONS PREMIUM OFFERS
JUST OUT—Write for it—Ask for No. 200

PORTLAND SEED CO
Portland, Oregon—Spokane, Wash.

WHOLESALE RETAIL

THE DALLES NURSERIES

Portland Wholesale Nursery Company, Owners
(Successors to R. H. Weber)

GROWERS OF
Choice Fruit and Ornamental Trees, Grape Vines, Small Fruit Plants and Shrubbery

We do not employ Agents, but sell DIRECT to the Planter, making Commercial Orchards a specialty

All correspondence should be addressed to
THE DALLES NURSERIES
Room 3, 122½ Grand Avenue
PORTLAND, OREGON

REMEMBER—OUR TREES ARE GROWN STRICTLY WITHOUT IRRIGATION

pay freight. We also advise using the diamond pack.

Summer Apples—Pack only one grade of summer apples, "Orchard Run," but in making this pack keep out all very small and wormy apples. Do not put grade mark on box, only your number and variety.

### Pears

Fancy—Must be free from worms, smooth and of good shape; gross weight fifty-three pounds or more. The number of tiers must be stamped on the box. Four tiers should measure from two and three-fourths (2¾) inches up. Five tiers should measure from two and one-fourth (2¼) to two and three-fourths (2¾). Six tiers should measure from two and one-fourth (2¼) down, but not so small but what they will make a good heavy six-tier pack. A five-tier pear is 3-3 pack and not over six long, which would make not over 180 pears. Some growers pack 3-3 pack, but seven long, which makes 210 pears. This pack will be marked and considered six tier.

Choice—This grade should consist of pears which are slightly scarred, otherwise defective and reasonably free from worms, not culls. In fact, stock that is only a little below the fancy grade.

### Plums and Prunes

The large fancy Hungarian, Italian, Botan, Greengage, Egg, etc., are put up in four basket crates, well filled, gross weight twenty-eight pounds or more. Small varieties, Wild Goose, Mariana, Damson, and the smaller plums of all varieties in two and one-half (2½) inch boxes, well filled; gross weight eighteen pounds or more.

### Grapes

Concords in eight-pound Climax baskets and should be well filled. Muscat, Rose Peru, Tokay, Purple Damascus, Black Hamburg, in four basket crates, same as California, and must weigh twenty-eight pounds or more gross. See rule for packing grapes.

### Canteloupes

Standard crates must be packed three rows each side and five melons lengthwise, which will make 45 melons to the crate. Pony, same as standard, except six melons long, which will make 54 melons to the crate. Canteloupes must be carefully picked at least once a day.

Put your number, variety and grade on the upper left hand corner of the blank end of the box. Anyone who does not know when to pick fruit or how to pack it should consult with our inspectors or their neighbors.

To Dealers—In ordering peaches by wire or letter, the different grades will

TREES TRUE TO NAME. The SILVA-BERGTHOLDT CO. NEWCASTLE, CAL. PLACER NURSERIES

FRUIT TREES

ALL STANDARD COMMERCIAL VARIETIES

The best that good care can produce

Write us now concerning your Fall and Winter Planting

AGENTS WANTED

The Silva-Bergtholdt Company
121 Orchard Street Newcastle, California

FRUIT GROWERS, YOUR ATTENTION!

Royal Ann, Bing and Lambert cherry trees; Spitzenberg and Newtown apple trees; Bartlett, Anjou and Comice pears, and other varieties of fruit trees

A. HOLODAY

MONTE VISTA NURSERY
SCAPPOOSE, OREGON

True-to-Name Nursery
OFFERS TO PLANTERS

Desiring strictly first-class one-year-old trees grown on No. 1 whole roots a few thousand apple, pear and cherry of the leading varieties adapted to the Pacific Northwest. We make a specialty of growing Yellow Newtown and Spitzenberg and personally select all buds and scions from bearing and tested trees. Order now for fall 1909; get trees guaranteed "true to name," and avoid future disappointment. Address

H. S. GALLIGAN

Phone Home 2002K Hood River, Oregon
Catalogue on Application

SALESMEN WANTED

WALNUTS

VROOMAN PURE BRED FRANQUETTE

Recognized as the *best commercial walnut* on the market today. It is hardy, bears regularly and heavily, with meat of rich, nutty flavor. Both seedling and grafted trees in stock. Write us for information and prices. Literature free.

Oregon Nursery Company
SALEM, OREGON

*420 Acres Devoted to Nursery Purposes*

THE WOODBURN NURSERIES

Established 1863 by J. H. Settlemier

Grower of Choice
Nursery Stock

F. W. SETTLEMIER
WOODBURN, OREGON

A Reputation to Sustain

VINELAND NURSERIES COMPANY

Propagators of

Reliable Nursery Stock

All Stock Budded From Bearing Trees
Fruit and Ornamental

CLARKSTON, WASHINGTON

F. K. Spalding, Pres. W. S. McClain, Sec.
Harry K. Spalding, Vice Pres.

The Sunnyside Nursery Company

Paid up Capital $26,000.00

The Sunnyside Nursery Company have sold practically all of their stock for spring delivery of 1909, and call your attention to the great stock they are growing for next year's trade. They will have

1,000,000 Apple Trees
200,000 Pear Trees
150,000 Peach Trees
100,000 Cherry Trees
50,000 Miscellaneous Varieties

Most complete stock in the Northwest. Write for prices

*Main Office at Sunnyside, Washington*
*Branch Nursery at Grandview*

Yakima Valley Nursery

Incorporated $60,000 Fully Paid

*LARGEST STOCK OF*

FRUIT TREES

in the Pacific Northwest. Special prices for large planters. *Salesmen Wanted Everywhere*

W. D. INGALLS, *President and Manager*

NORTH YAKIMA, WASHINGTON

NUTS *and* FRUITS *and* FLOWERS

Are you seeking some especially rare plants or beautiful flower? If so write to us about it. Our stock includes almost everything in hardy plants and trees for garden and orchard. Rare Japanese Plants a specialty.

Okanogan Nurseries
OMAK, WASHINGTON

be known as Extra, Fancy and Choice. We guarantee our pack to grade as above, and in case they do not, please advise us, giving stencil number.

◈ ◈ ◈

Louisiana, Missouri, April 14, 1909.

*E. H. Shepard, Publisher "Better Fruit," Hood River, Oregon.*

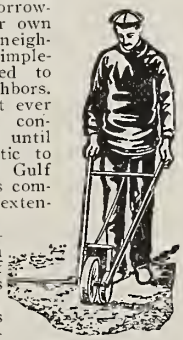
Dear Sir: We are just in receipt of your April issue, spraying edition, and wish to take this opportunity to congratulate you on its seeming excellence from cover to cover. We have not as yet had an opportunity to go over the matter, but from the table of contents and from a hasty glance through the pages it seems that you have covered the subject of spraying in a most comprehensive and thorough manner. The orchardists and fruit tree planters of the Hood River Valley and adjoining valleys are fortunate in having a publication of the class of "Better Fruit" on which to depend for reliable information covering all departments of their work. We will appreciate it very much if you can send us an extra copy of this spraying edition. Yours very truly,

Stark Bros. Nurseries & Orchards Company.
E. M. Wilson, Advertising Manager.

◈ ◈ ◈

## TO "THE MAN WITH THE HOE"

A generation ago Samuel Allen was tilling his land in the same way as all the rest of the farmers. He was a good farmer, and he was not satisfied with doing the work in the slow, back-breaking way it had always been done. He wanted bigger results, without working so hard to get them. He knew what kind of tools he needed, but there was nothing but the old-fashioned farm implements that had always been used, so he started to make implements for himself that would help him do the work of his farm. His neighbors soon saw how easily he did his work and how he actually got larger crops with less seed. The first thing he knew, his neighbors were borrowing his implements to do their own work with. Seeing that his neighbors thought so much of his implements, Mr. Allen determined to make more and sell to his neighbors. He started, and has been at it ever since. His "neighbors" kept constantly increasing in numbers, until they reached from the Atlantic to the Pacific, and from the Gulf beyond the Lakes; and he was compelled to manufacture on an extensive scale.



Mr. Allen calls his implements the "Planet Jr." from the resemblance of certain of the implements to the planets revolving around the sun.

Mr. Allen's ingenuity shows itself in every one of the forty-five kinds of Planet Jr. farm and garden implements which he makes. For instance, the No. 25 Planet Jr. hill and drill seeder, double-wheel hoe, cultivator and plow combines every useful garden tool in one strong, light, easy running, simply adjusted implement that does the work of three to six men working in the old-fashioned way.

The results obtained with these implements are simply marvelous compared with old-time methods. Their merit and popularity is shown by the two million users of these implements at the present time, and the enlargement of the factory which has been made necessary to supply the increasing demand. S. L. Allen & Co., of which Mr. Allen is head, is the organization which now makes these implements, and they have issued a new 56-page illustrated catalogue of Planet Jr. implements for 1909, which they are sending free to those who write to S. L. Allen & Co., box 11060, Philadelphia, Pennsylvania.

AGENTS WANTED

To sell our complete line of nursery stock. Cash weekly. Outfit free.

ADDRESS

Capital City Nursery Co. *Salem, Oregon*

PORTLAND WHOLESALE NURSERY COMPANY

*Room 10 Lambert-Sargeant Building*
CORNER EAST ALDER AND GRAND AVENUE
PORTLAND, OREGON

Burpee's Seeds that Grow

140 VARIETIES ANY QUANTITY

Plenty of Stock in our 40,000 Pounds

Growing Plants as Season Requires
All Makes High Grade
Pruning Tools
Garden Tools
Hose and Spray Nozzles
International Stock and
Poultry Food
International Remedies
Incubators and Brooders
Everything for Building
Everything for Furnishing

Stewart Hardware & Furniture Co.

*22,000 feet floor space* HOOD RIVER, OREGON

"THE OLD RELIABLE"

Albany Nurseries

INCORPORATED

ALBANY, OREGON

Large Stock, First Class Trees

Place Your Orders Now

*Catalogue Free*

*MORE SALESMEN WANTED*

GOOD TREES

The planter who sets in his orchard other trees than the best he can buy—is making a serious mistake.

A good tree at a fair price is cheaper than a poor tree or one of questionable worth as a gift.

Orchard land is too valuable to be encumbered with trees that will be a long time in bringing returns.

Our trees are grown on the Yakima Reservation, isolated from old orchards, being as a consequence, free from pest or disease, and, possessing a splendid root system, they make a rapid growth and come into early bearing.

*Agents everywhere*
*More wanted*

Washington Nursery Company
TOPPENISH, WASHINGTON

St. Helens Hall

Portland, Oregon

A GIRLS' SCHOOL OF THE HIGHEST CLASS

CORPS OF TEACHERS, LOCATION, BUILDING, EQUIPMENT THE BEST

Send For Catalogue

*When you come to Portland go to*

The Cornelius

Corner Park and Alder Streets, Portland's newest and most up-to-date hotel. It is sometimes difficult to make a change in hotels. However, give "THE CORNELIUS" a trial on your next visit to Portland and be happy. European plan.

Rates reasonable.

*DR. C. W. CORNELIUS, Proprietor*

## PROFITABLE PEACHES

BY T. L. BUTTON, IN KENTUCKY FARMER

THE three varieties of peaches that I have found most profitable are the Elberta, Smock and Salway, in order of value as named. We have no other variety of peach like the Elberta. Its magnificent appearance, its evenness of size and coloring, and its keeping and carrying qualities, make it decidedly the queen of the peach family.

I have never failed to get big returns from my Elbertas. In 1907 I netted one thousand dollars from one hundred and twenty Elberta trees, the largest net sales I ever received from peaches. These Elbertas grew on old trees on an eastern slope, and were scattered over nearly two acres of ground, thereby affording plenty of root-feeding area and thorough circulation of air and sunshine. These peaches were allowed to thoroughly ripen and color on the trees, which the Elberta will admit of, and were very carefully picked and packed in six-basket carriers. These were the best flavored Elbertas I have ever tasted. The peach crop was short everywhere and the markets good, and by so handling these Elbertas as to make about all of them fancy, I was able to reach this high mark.

The ordinary Elberta found on our markets is a poorly flavored peach. What makes the Elberta the most popular and valuable variety is its good appearance, large, uniform size and coloring, and its unexcelled keeping and carrying qualities. Another good point

When you get to Hood River stop at the

MT. HOOD HOTEL

Trains stop directly in front of Hotel. ¶ Bus meets all boats

Automobile Service Daily for Cloud Cap Inn During Months of July, August and September

*Plan Your Vacation Now at Our Expense*

A CHOICE OF FOUR

FREE TRIPS

IS OFFERED YOU

Seattle, during Alaska-Yukon Exposition
Yellowstone National Park
Yosemite Valley Lake Tahoe

ALL YOUR EXPENSES PAID

*If you have friends in the East who want to visit the Pacific Coast we can arrange it*

THIS IS YOUR OPPORTUNITY

*For Complete Information Address*

SUNSET TRAVEL CLUB ROOM 16, FLOOD BUILDING SAN FRANCISCO

Stanley-Smith Lumber Co.

WHOLESALE AND RETAIL

LUMBER

Lath, Shingles, Wood, Etc.

Hood River, Oregon

Oregon Box & Mfg. Co.
Portland, Oregon

MANUFACTURERS OF

SPRUCE BOXES
DRIER TRAYS

Write for price before placing your order

about it is the duration of the picking season. It will hang for one week after being ready to pick without serious loss, or can be picked green and will sell well on our markets.

The next variety in my orchards in point of value is Smock. There are several distinct types of Smock, some better than others. As a whole, I have always gotten good prices for my Smock, the best grades selling as well as Elbertas. I have no record for Smock, but am quite sure the net sales have run up into hundreds of dollars per acre.

The Salway is the third most profitable variety I have grown. In the fifteen years I have made more money from Salways than from any other variety, as it is the hardiest in bud and surest bearer. Several seasons when Elbertas failed I have had a half crop of Salways, but I have only been growing the Elbertas extensively for seven years.

The Salway is an acid peach, rich in flavor and color, and one of the best for canning. It is a good keeper and shipper. In 1898, from a three-acre block of Salways, I received $1,500 net returns. All my peaches were sold in Louisville that year. There are a great number of other varieties that are successfully grown in Trimble County and which I have planted in young orchards.

The peach is a fruit that will not admit of much neglect in the orchard. A close study of the requirements of the trees to produce fruit to meet requirements of the markets is more largely responsible for my success in making money out of peaches than the varieties grown. Without the right kind of land and location for the peach orchard there is no likelihood of success at all. The marketing end of the business is where too many of our Kentucky fruit growers fall down. I have made blunders and mistakes in marketing, and on several occasions have been literally skinned by unscrupulous commission men, but upon the whole, my success is due to producing good fruit and selling it on our markets for its value.

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We make them of every description

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TWENTY-FOUR HOUR SERVICE

City Water Works System for Domestic and Municipal Use. Are prepared to furnish 3000 Horse Power, either Electric or Water, at Reasonable Rates

*General Office*, HOOD RIVER, OREGON

# A SHORT TREATISE ON PRUNING THE CHERRY

BY PROFESSORS PADDOCK AND BAILEY, COLORADO EXPERIMENT STATION

THERE is, perhaps, no question in orchard pruning about which authorities differ so much as pruning the cherry. The reason seems to be on account of the differences in varieties that are adapted to different varieties of soil, climate and treatment. For instance, I find Professor Bailey saying, "The cherry likes an elevated, naturally light, dry, loamy, retentive soil." Yet the cherry grew wild in Illinois when we removed to that country in 1865, and the tree grew so large in the skirts of timber land in that state, that it was often sawed into lumber; while in the prairies were little groves or clumps of trees, of which the cherry was the most vigorous grower. Illinois was a wet climate, but the soil seemed especially adapted to the cherry.

He says further, "The sweet kinds are started with three to five main arms, with no central leader, about 3½ feet high, and the branches are pruned to side buds to induce a spreading rather than a spine-like form." But very many now are teaching that the cherry should have little, if any, pruning, especially in this climate. The reasons given are that the wounds caused by pruning produce gumosis, and will finally lead to the death of the tree. Further, that the natural growth of the cherry is more beautiful than the unnatural shape given by pruning. To us it would seem that some pruning is necessary and that gumosis can be prevented by painting the wound with coal tar or some other mixture to close the pores. As to the natural beauty of the top, this is a matter of taste. No two persons will probably agree as to their ideals of beauty. Plato said, "Ask a toad what is beauty, and he will prob-


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HOOD RIVER, OREGON
Headquarters for
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When you want any kind of Orchard Tools come to me and get the BEST

POULTRY
on a FRUIT FARM
Write for Special Information regarding Our Poultry Foods, Rations, Remedies and Supplies
LILLY'S BEST
Largest Manufacturers of
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Practical chicken men universally concede
OUR LEADERSHIP
SPECIAL ATTENTION to Fruit Specialists who are Amateur Poulterers
Write for our Poultry Book
The Chas. H. Lilly Co.
SEATTLE PORTLAND

RHODES DOUBLE CUT PRUNING SHEAR
Pat'd June 2, 1903.
THE only pruner made that cuts from both sides of the limb and does not bruise the bark. Made in all styles and sizes. We pay Express charges on all orders. Write for circular and prices.
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RHODES MFG. CO., GRAND RAPIDS, MICH.

Don't Mangle and Stunt Your Trees and Shrubs!
With the ordinary pinching shears. Their life means money to you. The quickest healed cut in the world made by
Little Gem Pruner
Cuts from both sides with a draw cut, sliding action, like a knife. Recommended by Luther Burbank, foremost horticultural authority of the world. Write for further description and testimonials, with prices.
Mr. Phillips placed a 600-pair order within four weeks of his starting out in his own state. This shows what live people think of it. Don't wake up too late.
Halloway Mfg. Co., Exclusive Manufacturers, Dept. X., Ottumwa, Iowa

A Box of Apples, 96 size, sells for $3.00
A Box of Apples, 128 size, sells for $2.00
Difference, $1.00
A Gain of 50% By Using
Thinning Shears
This is the most practical pattern on the market today and used exclusively by Hood River Orchardists. Price 45c each, postpaid, or $4.50 per doz., express collect.
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Distributors Pacific Northwest
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Water thousands of Acres, but there are thousands more above the ditch which can be reclaimed by the Columbia Ram utilizing a small fall from ditch lateral or creek. ¶ The battery of Columbias as shown above irrigates about 240 acres of Grand View Hill, at Sunnyside, Washington.
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Columbia Steel Co.
148 N. 10th Street, Portland, Oregon

ably say the short, warty, chubby female of his own species." The nappy haired, low browed, thick lipped and ebony colored African is beautiful to the members of her own race, but to us she is little above the beast. So in gardens, lawns and orchards, there is no absolute form of beauty, but what may seem so to one may seem to another deformity. In domesticated animals some try to improve the appearance of the dog by cutting off his ears and tail, or the horse by docking. But the cherry is raised for profit more than for ornament. Yet the cherry in this country is considered a handsome tree; tall, straight, well formed and symmetrical. It would seem that little pruning was necessary.


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Don't let your surplus fruits and vegetables go to waste. Can them, the same as a large canning factory. There's always a market for canned goods, and for a small investment you can buy a

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and build up a big, profitable business. All sizes; fully guaranteed. Write for catalogue.

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J. R. NICKELSEN
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WRITE US for tip on how to put COLOR ON FRUIT and make it a LONG KEEPER

Certain Fertilizers with certain Soils—that is the Secret—and we speak from TWENTY YEARS' EXPERIENCE with Pacific Northwest soils—experience that means dollars for the Fruit Grower

WE KEEP ALL COMMERCIAL FERTILIZERS

POTASH Muriate Sulphate
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All our Analyses Guaranteed

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Spraying Materials for all Purposes and ALL SEASONS—ready to use at once, only needs diluting. We keep Scalecide, Lime & Sulphur Solution, Arsenate of Lead, Whale Oil Soap, Quassia Chips, etc., etc. JUST OUT—Write for our new No. 205 Catalogue.

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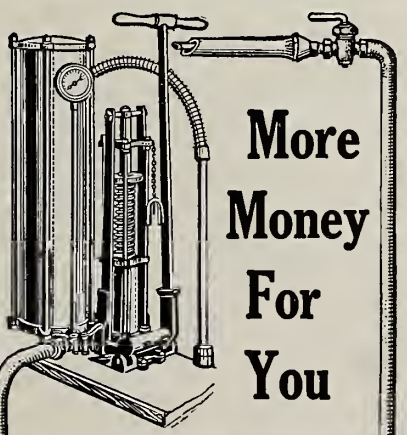

More Money For You

Greater productiveness of trees—larger, cleaner, and finer fruit—more money. Isn't that fruit growers' reasoning? Nothing will contribute to this end more than effective spraying. And **Effective Spraying** can best be attained with

Bean Magic Spray Pumps

Effective spraying means **High Pressure Spraying** and till the advent of the Bean Magics a high pressure could not be maintained with a hand pump for any length of time, on account of the body-racking effort needed to operate it. The Bean patent spring divides the work between the two strokes of the handle and works against only one-half the pressure shown on the gauge and saves exactly one-third the labor.

Our illustrated catalog No. 21 describes ten sizes of hand pumps, and contains much valuable spray information, and formulas. Catalog No. 22 describes Power Sprayers. Both books sent free. Write for our special offer; state number of acres and kind of fruit.

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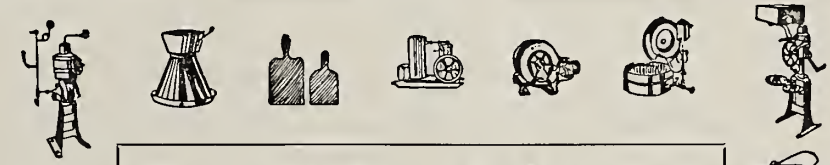

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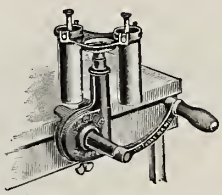

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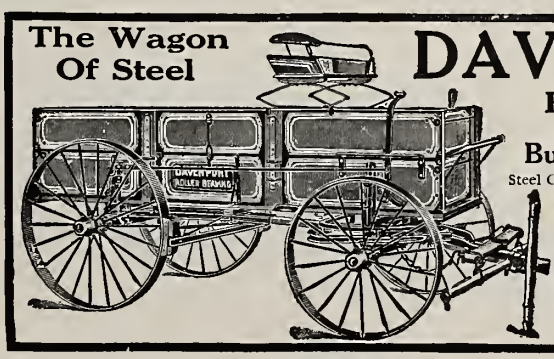

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Steel Gears and Wheels trussed like a bridge. Automobile Hub. Oil Without Removing Wheels.
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ALL OF OUR CLAY PRODUCTS ARE OF THE VERY BEST QUALITY

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# *White Salmon*
# FRUIT LAND

Here is an opportunity to buy an apple orchard in the most famous apple belt in the world; one and one-half miles from Underwood, on the North Bank Railroad, and located on a county road of five per cent grade; White Salmon River borders this tract; a large hillside spring piped to the property furnishes an abundance of water the year round. Apples raised in this district were prize-winners at the Spokane National Fruit Fair. Strawberries are ready for market from this district two weeks earlier than elsewhere. Last year five acres in strawberries paid $1,500 net. We now offer this land in five and ten-acre tracts, cleared and planted with Spitzenberg and Yellow Newtown apples, on easy terms, or uncleared land in this tract at reasonable prices. For further particulars, write to apply to owner.

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WHITE SALMON, WASHINGTON

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**The Home of the Prize Red Apples**

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**All kinds of the best Fruits, Vegetables, Grains, Grasses and Hops are produced without failure. IT IS UP TO YOU to start in the right location, GET A HOME and be independent.**

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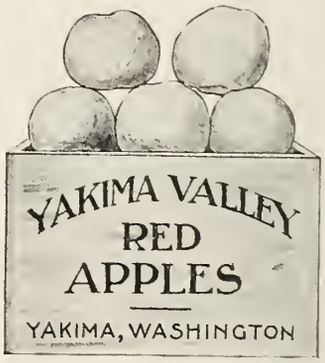

*North Yakima, Wash.,*
*Feb. 15, 1909.*

*Mr. C. W. Mott,*
*G. E. A., N. P. Ry.,*
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*Dear Sir: — I own 20 acres; paid $100 an acre for same in 1884. Could sell now for $2,500 an acre. It is all in apples, peaches, pears and apricots. My average crop is $7,000 for the apples; $1,500 for the pears, and $1,500 for the peaches and apricots. Have got $1,200 off one acre of Rome Beauty apples. Yours truly,*

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*First Premium State Fair 1907-08*

**Corvallis, Oregon**

County seat of Benton, in the heart of the famous Willamette Valley. Greatest dairy section of the West. Land unsurpassed for walnuts and fruit. Irrigation not required. Apples and peaches have better flavor and keep longer than those grown under irrigation. Extensive plantings of commercial orchards near Corvallis. The best farm lands cheaper than at any place in the valley; no inflated values. Corvallis has a population of 6,000; 200 new residences constructed since January 1, 1908. Oregon Agricultural College, the largest educational institution in the Northwest, 1,500 students, located here. Pure mountain water and all modern conveniences. No extremes in temperature. Opportunities here worth your while. For particulars write

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**ROGUE RIVER VALLEY**

*Famous for its* APPLES, PEARS, PEACHES, GRAPES, MELONS AND CLIMATE

THE natural home of the Spitzenberg and Newtown apples. Rogue River pears have led the United States for past five years in the highest price in the New York market. No peaches of the South excel those of Rogue River, and trees are healthy. Grapes perfection in color and flavor and the best of shippers, and growers have more orders than they can fill. Rogue River cantaloupes, watermelons and cassabas, none better and big money makers. The Rogue River Fruit Growers' Union gets the highest price for fruit, and the Southern Pacific gives terminal rates on shipments East. Climate the perfect medium between arid California and webfoot Oregon. No storms or winds to injure fruit crop. Almonds and figs ripen perfectly and palms grow in the yards. Land yet cheap, but will double in two years. American community and good schools, rural mails, telephones, etc. Full information by addressing CHARLES MESERVE, Medford, Oregon, Seller of *Real Estate in All Parts of Rogue River Valley.* References by permission: Rogue River Fruit Growers' Union, First National Bank of Medford.

## PRACTICAL ADVICE TO THE ORCHARD BUYER

WITH the awakening that is coming to the fruit industry on account of the vast possibilities and unlimited opportunities in this special line of business, naturally comes the promoter. There are various means and various ways of promotion. Some are good, others are better, and some are not good. Speculation naturally becomes a factor when any business is prosperous. The speculator does not command the highest esteem of the fruit grower. Fruit growing districts want people to settle in a community who intend to stay and become identified with the industry. There is no doubt of legitimate business being done by capital in the way of buying tracts and setting them to orchards and caring for them properly until they come into bearing. This method enables a man of limited means, or one who holds a position, to continue his work, whatever it may be, and have his orchard cared for until it comes into bearing and is sufficiently developed to support him. The system is good where backed up by concerns that are financially responsible and managed by people who are reliable. There are companies operating along this line that command the confidence of the fruit growers and the business men in the community where they exist. There are other concerns who do not. We have

**Stop–Look–Listen**

**HOOD, WASHINGTON**

A new town, located sixty miles east of Portland, Oregon, on Columbia River, overlooking the famous Hood River Valley, Oregon. Here can be grown the small fruit, the big red apples, nuts and grasses, without irrigation. The ideal country for the man with small means. Transportation facilities are by rail and boat. Land values from $40 to $150 per acre. Information can be had by writing Secretary

**Hood Development Association**

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*With best of prices, scenery, climate, transportation, soil, mountain water, timber, etc. Send for lists of lands and literature*

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**R. Field & Co.** WHITE SALMON, WASHINGTON

You will have to act quickly if you want any of them, because land in this famous

**WHITE SALMON VALLEY**

Is rapidly increasing in value. We have sold many tracts of land in the last three years, and those who bought from us are all well pleased. We can refer you to them. We also have bargains in city property and are daily listing other outside tracts, which we will be glad to show you. We guarantee every tract as good as represented.

No. 167—4 acres close to town. Very rich fruit land and early strawberries. Unimproved, some slashed, and will make a nice home. Price, $1,800. One-half cash, balance on terms.

No. 172—39 acres, five miles out. Mostly unimproved, but has some clearing. All good fruit land, easy to clear. School and church on place. Price, for a short time, $2,600; terms to suit.

No. 175—80 acres, four miles out; 70 can be cultivated. All unimproved land; good for apples or any other fruit. A good buy at $50 per acre; half cash.

No. 176—58½ acres, 4½ miles out, two miles from railroad station and boat landing. All good fruit land except 8 acres which is too steep to cultivate. Creek runs through the place; three good springs. 20 acres in cultivation; 4 acres in bearing orchard, 12 years old, mostly apples; 50 trees ready to set out. Good five-room house, barn and other outbuildings, all under fence and on county road. Price, $5,000; terms.

No. 181—8 acres, close in. Rich soil, good for fruit or berries; directly under the proposed irrigating ditch; all level. Small bearing orchards; ¾ acre of strawberries; all under fence. Good level road from town. An ideal home at $2,800, on good terms.

No. 182—10 acres, one-half mile out. Deep, rich soil; 7½ acres in high state of cultivation; gentle southwest slope, easily cultivated; very early fruit and berry land. The irrigating ditch will run on the north line, making very little expense to connect. Has 6 acres out to fruit trees from one to three years old; one acre to strawberries; balance of land easily cleared. Nicely sheltered and a magnificent view. Good new nine-room house just built; plenty of tools, such as plows, harrows, cultivators, etc. This can be made one of the best homes in White Salmon. Price, $5,000; can be had on easy terms.

No. 192—40 acres, unimproved, eight miles out. Good, red shot soil; apple land; about 25 acres is fine level land; 15 acres is rolling. Price, $1,100; $500 cash, rest terms.

No. 196—160 acres, nine miles out. Unimproved, with some fine fir timber on it; some is rolling and some is level land; soil rich red shot. Only $16 per acre; terms, half cash, rest two years.

No. 199—30 acres, one mile from town; 15 acres cleared and mostly set out to fruit trees and strawberries; all under fence, with a fine creek of water running through it, which can be used for irrigating about 3 acres for garden which is very rich bottom land. Soil is light volcanic ash, very rich and good to keep up moisture in summer. Price, $10,000.

No. 201—8 acres 1½ miles from White Salmon. Fine land, half cleared and set out to fruit trees and strawberries; very rich red shot soil. In the irrigation district and will make a nice home. Price $2,800; half cash, rest in 3 years.

No. 202—A fine unimproved 40 acres close to Husum, in the White Salmon Valley. Good soil for Spitz. and Newtowns. Is mostly level and is a good buy at $4,000; half cash, rest in 2 years.

No. 203—40 acres 1½ miles from Snowden; 30 acres nice land, rest is rolling; some good fir timber. Good apple land, at only $1,000, and will also sell 80 acres at same place at $2,000.

No. 204—160 acres 9 miles from White Salmon. Good rich soil with large percentage volcanic ash; has a spring and creek on place. Would do well to cut up in 20-acre tracts; 140 acres tillable, 20 acres is rough; also 3,000,000 feet of fir timber on this place and not far to saw mill. Timber will more than half pay for the land and the price is only $35 per acre. Terms.

No. 205—55 acres 2 miles from Husum; about 3 acres cleared; 40 acres level, rest is rolling. A good bargain at $3,000; terms.

No. 206—40 acres 7 miles from White Salmon; the very best of fruit land; lies just nicely rolling for apples. There are some 8 acres cleared and rest mostly cleared; with a little work all can be put in soon. There are 500 fruit trees set out on it. The price is right, $4,500; half cash, rest five years' time.

No. 207—160 acres 2 miles from Husum, unimproved; partly good for cultivation, partly pasture land; some good fir timber on it. A snap at $20 per acre.

No. 208—160 acres 8 miles out; 90 acres level, rest is rolling, too steep to cultivate. Very rich red shot soil; 22 acres in high state of cultivation, 20 acres in orchard, mostly all bearing, in good condition. A house 18x30, 7 rooms, barn and other outbuildings. Price $10,000; terms half cash. The orchard will pay for the land in a few years.

No. 209—160 acres 4½ miles from White Salmon; 2 acres cleared and in bearing orchard; some is level and some rolling land; a fine piece to cut into small tracts. Price $65 per acre.

No. 210—We have for a short time for sale the famous Ziegler fruit farm in the apple belt, 12 miles from White Salmon; 120 acres; 25 acres in fruit trees just in bearing, Spitzenbergs and Newtowns. The soil is very rich red shot, that from 120 acres half can be cultivated; rest is too rough. This place will pay for itself in a short time. Price only $9,000; $3,000 cash, balance, terms to suit.

No. 211—40 acres, 12 miles out. All good rich shot land and level; the very best for apple culture; all under good fence; 20 acres heavy timber; fine spring of water; half mile from Snowden post office. Price $1,800; terms.

No. 212—160 acres 11½ miles from White Salmon. All No. 1 tillable land, with 8-inch flow of water; 3 acres out to fruit trees and 40 acres in cultivation; has good house and barn. A snap at $8,000. Good terms.

heard of sales being made, so much down and so much annually, orchard to be properly cared for until it comes into full bearing, and we have been told by men who know, who have seen some of these tracts, that the weeds were waist high and poor work had been done in the way of preparing soil. Cheap trees are being set out, and some orchards are set out and sold on the installment plan that will never make orchards in a hundred years. Some cases exist where it would be better for the man owning the land to dig up the trees set out and reset good ones. We regret there are such concerns. We are glad to state that, so far as we know, we believe they are comparatively few; consequently, our advice to men intending to become fruit growers, or contemplating purchasing an orchard is, that if they buy of a company selling tracts on this plan, to ascertain positively that the company is financially responsible, that the men are reliable, that they know their business.

◈ ◈ ◈

WILLIAM COOPER & NEPHEWS of 177 Illinois street, Chicago, have issued a splendid little booklet giving full description of their sprays, which are so popular in England and are now being introduced into America.


Pacific Seed Co.
201-203 Front Street
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GRASSELLI'S
*The Best Arsenate of Lead Made*

Lime-Sulphur Spray
*The Famous Niagara Spray*
A perfect and permanent solution and so highly concentrated that one gallon will make twelve gallons spray winter strength, and twenty summer strength. The extensive use of Niagara in the leading fruit sections attests its value
MANUFACTURED BY
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WE INDORSE
SCALECIDE
as the best Spray for PACIFIC NORTHWEST Fruit Trees. It kills *San Jose Scale*, all Soft-Bodied Insects and Fungus. Write for Booklet No. 204 and for FREE SAMPLE
PORTLAND SEED CO. DIAMOND QUALITY
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Sprays Fertilizers Horticultural Supplies

GRASSELLI'S ARSENATE OF LEAD
For the Destruction of the Codling Moth and All Leaf-Eating Insects, Use Grasselli's Arsenate of Lead

CODLING MOTH

¶ Grasselli's Arsenate of Lead is manufactured only by The Grasselli Chemical Company, established 1839, General Offices, Cleveland, Ohio. ¶ When applied, ordinary rains will not wash it off. It is not injurious if applied unskillfully or in too great quantities. ¶ Grasselli's Arsenate of Lead can be used successfully against all leaf-eating insects, including the Codling Moth, Canker Worm, Elm Leaf Beetle, Potato Bug, Gypsy and Brown-tail Moth, etc. ¶ **Grasselli's Bordeaux Mixture**—a preventive of all fungous diseases. ¶ **Grasselli's Bordeaux-Lead Arsenate Mixture**—an insecticide and fungicide combined in one effective article. ¶ Write for descriptive booklet giving information how and when to spray.

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Send Inquiries to Nearest Office

## THE PROPER POWER TO USE FOR SPRAYING

ATTENTION is directed to the facilities for spraying afforded by the International Harvester Company of America, as advertised elsewhere in this paper. The first requisite to good spraying is proper equipment. And the heart of the equipment is the power used to drive the spray mixture home. For all large spraying operations some sort of power other than hand power is a necessity. Resort has been had to connecting the spray pumps to the wheels of the cart or wagon which carries the spray mixture tank. But this is not the best method, for the very obvious reason that power can only be generated while the vehicle is in motion, and spraying of trees necessarily requires the vehicle to stand for considerable lengths of time in one place. Trees in an orchard, for example, are close together, and merely driving from one to the other cannot generate enough power to do a thorough job of spraying. The gasoline engine, as adapted to this use by the International Harvester Company, supplies the sort of power the sprayer requires. It is economical; it is dependable; there is power in abundance for every possible requirement. The man who uses an International Harvester Company engine for spraying, finds that he can spray the tops of the larger trees, because he has the power to make the spray mixture carry that far. The International Harvester Company of America offers a line of complete sprayers, known as the Famous Spraying Outfits. These consist of an International Harvester Company gasoline engine and some well-known efficient spray pump, mounted together on skids or on wheels and fitted with the necessary connections and attachments, all ready to begin spraying operations. Or, if the purchaser prefer, he may purchase one of the many styles and sizes


Read What They Say at **PULLMAN COLLEGE**
RIGHT HERE IN THE PACIFIC NORTHWEST ABOUT
**EAGLE BRAND ARSENATE of LEAD**

**FAR SUPERIOR IN DESIRABLE PROPERTY**
Pullman, Wash.,—More striking differences were observed in the tendency of the compounds to remain suspended in water or to settle quickly when mixed with water. Its ability to stay in suspension, a property very desirable for spray purposes, the Eagle Brand is far superior to any of the others. This was even more noticeable after longer standing. (Report shows the proportion was 10 to 1).
R. W. THATCHER, Station Chemist.

**WE ADVOCATE ITS USE AT EVERY OPPORTUNITY**
Pullman, Wash.,—Eagle Brand Arsenate of Lead has given better results than any of the other brands of arsenate that we have tried. The differences have been so marked that I do not hesitate to recommend your brand to anyone inquiring. Gives entire satisfaction in controlling Codling Moth as well as other insect pests and we are advocating its use at every opportunity.
A. L. MELANDER, Entomologist.

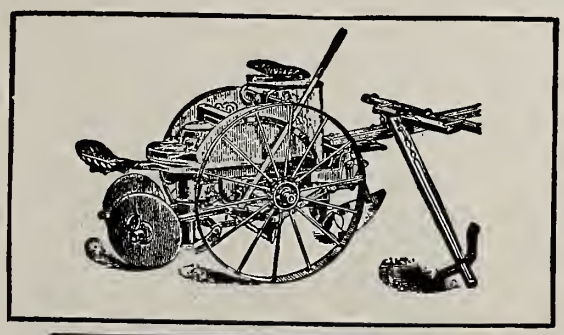
Eagle Brand adheres to foliage forming a thin film which is not easily Washed off by rains, and therefore does not require repeated applications involving much expense. It is particularly well suited for spraying tender foliage because it does not scorch even when applied in strongest solutions. It remains in suspension a long time without requiring constant agitation.

For information, folder and prices address the great Seed and Supply House. Also write for Spray Book

**THE CHAS. H. LILLY CO., SEATTLE AND PORTLAND**



**IRON AGE**
**IMPROVED ROBBINS POTATO PLANTER**



PLANTS A LARGER POTATO
**PLANTS 100%**
Spaces from 12 to 24 Inches
**DOES NOT BRUISE OR PUNCTURE THE SEED**
Makes No Misses or Doubles
Furnished With or Without Fertilizer Attachment
For Sale by over 200 Agencies in Pacific Northwest
*Ask for IRON AGE Catalog describing Garden Tools*

**R. M. WADE & CO.**
OLD-ESTABLISHED IMPLEMENTS & VEHICLES UP-TO-DATE
322 HAWTHORNE AVENUE
PORTLAND, OREGON

of I. H. C. engines and connect it himself with any make of spray pumps he may decide to use. A catalog, illustrating the different Famous Spraying Outfits and giving particulars on the various International Harvester Company gasoline engines that are adapted to spraying purposes, may be had by applying to any International local agent, or by writing direct to the International home office at Chicago.


HEADQUARTERS FOR

CENTURY SPRAY PUMPS

Hose, Nozzles, First-class Plumbing Supplies

C. F. SUMNER

Successor to Norton & Smith

HOOD RIVER, OREGON

A. C. SHAW ROY F. DEAN

Home Phone 3

Electric Wiring and Supply Co.

Hood River, Oregon

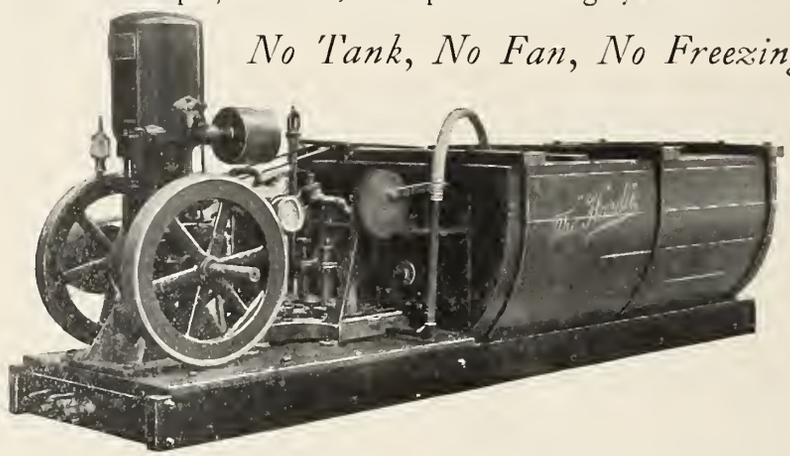
# The Hardie Triplex Sprayer

*Is fitted with the*

HARDIE GASOLINE ENGINE

This engine has the open water jacket system of cooling. A simple, effective, frost proof cooling system.

*No Tank, No Fan, No Freezing*



The Hardie one and one-half horsepower weighs 257 pounds. The three horse power weighs 385 pounds. Our catalogue gives description and prices of the engines, the Hardie line of sprayers, and contains information relative to what, when and how to do effective spraying. If you want it write us today.

THE HARDIE MFG. CO.

*Factory:* Hudson, Mich. *Western Branch:* 22 Front Street, Portland, Oregon

# Allen Fruit Caliper

Sizes Fruit accurately, rapidly and enables the practical Grower to put up the Commercial pack for the Fancy Trade. Live Agents wanted in every fruit district throughout the world.

CORRESPONDENCE SOLICITED

ALLEN & ERFERT

MISSOULA, MONTANA

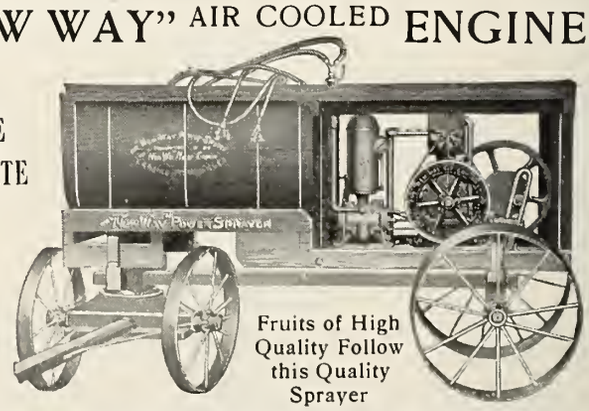
EASILY DETACHED
ALWAYS READY FOR ANY WORK IN ANY CLIMATE

THE "New-Way" POWER SPRAYER

IS EQUIPPED WITH THE FAMOUS

"NEW WAY" AIR COOLED ENGINE

GASOLINE DISTILLATE OR ALCOHOL FUEL



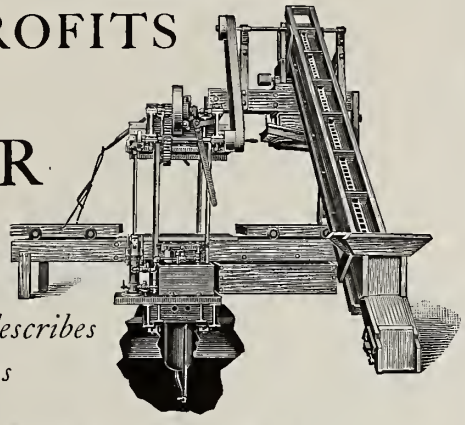
Fruits of High Quality Follow this Quality Sprayer

Carries high pressure without the usual vibration or strain, and is the most practical, durable and economical machine ever built for spraying. Use your own running gear if you prefer. Write us today for Spray Catalogue No. S-8

JOHN DEERE PLOW CO.

PORTLAND, OREGON

# BIG PROFITS IN CIDER



*Write for Catalog which fully describes and illustrates*

THE ORIGINAL MT. GILEAD

# HYDRAULIC

## Cider and Wine Presses

Capacity, 10 to 400 barrels per day. Made in all sizes, hand or power

## FULLY GUARANTEED

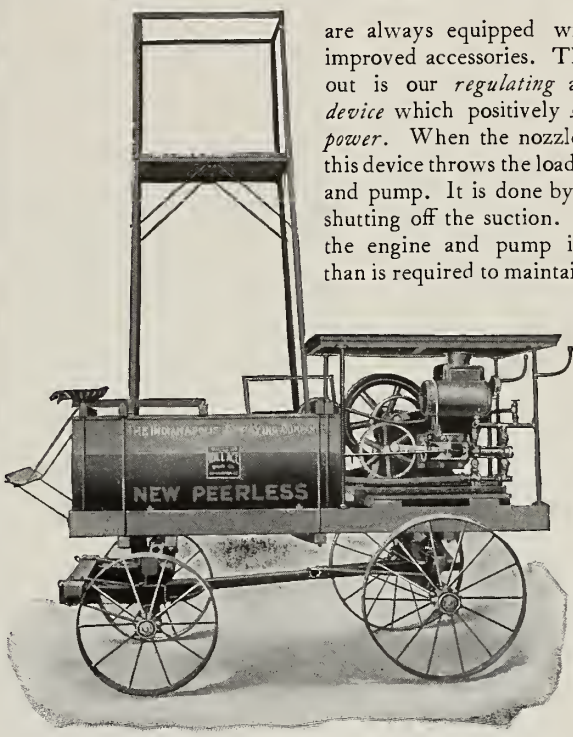
Write for any information desired. We can show you how $1,500.00 clean profit can be made.

**The Hydraulic Press Mfg. Co.**

*Largest Manufacturers of Cider Presses in the World*

60 Lincoln Avenue MT. GILEAD, OHIO

# WALLACE POWER SPRAYERS




are always equipped with the most improved accessories. The latest thing out is our *regulating* and *unloading device* which positively *saves half the power*. When the nozzles are shut off this device throws the load off the engine and pump. It is done by automatically shutting off the suction. The load on the engine and pump is never more than is required to maintain the pressure on whatever number of nozzles are used. Consequently our machines work under the minimum load all the time, instead of under the maximum load as others do.

*New Peerless Mounted*

Our New Peerless Sprayer shown above was the wonder of the National Apple Show, Spokane. It maintained a constant pressure of 200 to 220 lbs. with less than half the usual power. Better get informed about this. The device is applicable to all kinds of sprayers

AMERICAN SPRAYER & SUPPLY CO.

SPOKANE, WASH. Manufacturers Wallace Sprayers CHAMPAIGN, ILLINOIS

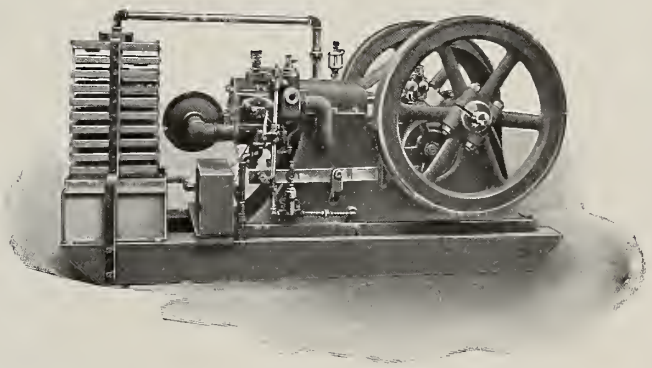
# IRRIGATORS—YOUR ATTENTION

*THE ALAMO is the best for you* *The price is right*

We have exhibited the Alamo engines at several of the local fairs. At the recent State Fair held in Salem we took with the Alamo engines all the prizes, which were as follows:

First prize on easiest starting engine.
First prize on best portable engine.
First prize on best deep well pumping outfit.
First prize on best centrifugal pumping outfit (irrigation).
First prize on best electric lighting outfit.
First prize on best gasoline engine exhibition.

These awards were only made after actual demonstration of the engines, and all other standard makes of engines were represented. The awards were all duplicated at Pendleton and Walla Walla.



The Alamo engine has been selected by the State University at Eugene, and also by the Oregon Agricultural College at Corvallis, as the best engine adapted to demonstrate the latest and most approved principles of gas engine practice to the students. Our 3-h.p. Alamo Victor vertical electric lighting outfit was selected by the Southern Pacific Company to light the demonstration train which toured the Willamette Valley last fall under the direction of the Agricultural College, and these people were so well pleased with the Alamo engine that it was again selected by them to light the demonstration train which recently toured Southern Oregon. The Westinghouse Electric Company and the Northern Electric Company, which as you know are the two largest manufacturers of electrical goods in America, have both adopted the Alamo gasoline engine, and now recommend them and illustrate them in their bulletins. A complete stock of engines, together with a full line of extra parts, is always available at Portland. If you will inform us concerning the exact use for which you wish the engine, we will be pleased to furnish you gratis what information we can concerning the necessary horsepower. We have had a great deal of experience in making installations of all sizes, and no doubt can be of some assistance to you.

*Send for free illustrated catalogue in three colors and get prices on our special offers*

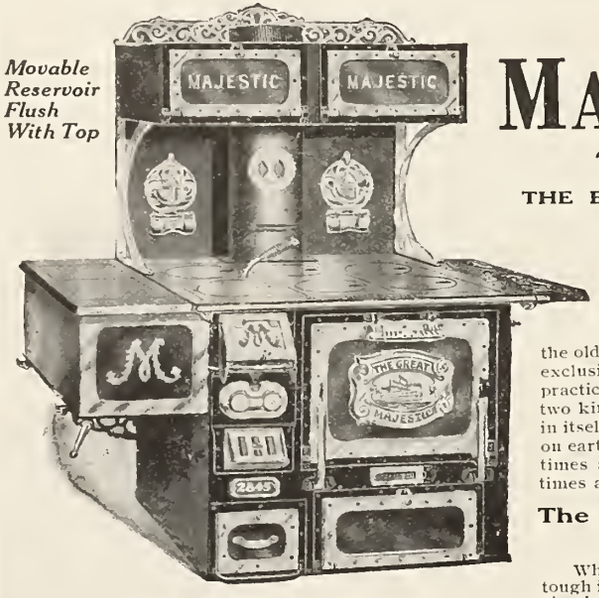
# BEEMAN-WOODWARD CO.

71 Front Street PORTLAND, OREGON

# THE GREAT MAJESTIC RANGE

*"The Range With A Reputation"*

**THE BODY OF THE MAJESTIC RANGE IS MADE OF CHARCOAL IRON**




*Movable Reservoir Flush With Top*

*With High Movable All Copper Reservoir*

## What Is Charcoal Iron?

Charcoal iron is what iron workers call the ***"pure iron of olden days."*** It is made from imported Swedish Iron Bloom, melted and refined in the old fashioned knobbling fires in which charcoal is used exclusively as fuel. Charcoal iron never rusts and there's practically no "wear out" to it. The exclusive use of these two kinds of iron in the construction of Majestic Ranges is, in itself, sufficient reason why you should buy no other range on earth. It means long service—the ***MAJESTIC*** lasts three times as long as an ordinary range. But don't cost three times as much.

## The Only Range in the World Made of Malleable and Charcoal Iron.

What is Malleable Iron? It is an exceedingly close grained and tough iron that can be hammered until it is all out of shape; but it is simply impossible to crack or break it.

The frame work, top, doors, etc., of the Majestic Range are made of malleable iron. That is what makes the ***Majestic*** practically indestructible and eliminates all expense for repairs.

The use of malleable iron permits of an absolutely air-tight riveting together of the joints. This explains why in a ***Majestic Range*** it is impossible for heat to escape or for cold to enter; why it uses such a small amount of fuel and why it is a perfect baker day in and day out. But there are other important reasons why you should give the Majestic the preference. Here are a few of them.

The ***Majestic*** has a 15 gallon, all-copper, movable reservoir that heats water while breakfast is cooking for those not having pressure water connections.

The oven is riveted air-tight which insures perfect baking. Bread, in a Majestic oven, browns evenly all over without turning.

The Majestic is lined throughout with pure asbestos board held in place with an iron grate—another big help in the saving of fuel.

The upper closet shelves have drop doors that form a perfect shelf when let down. It's the only kind of closet that can be thoroughly cleaned.

There are no springs in the oven door: the door drops down and forms a rigid shelf that will bear any weight. The oven rack slides out automatically holding anything it may contain.

The Majestic has an open end ash pan that acts as a shovel when placing back in position—you don't have to shovel surplus ashes out of the pit. There is a small ash cup under the ash pan which catches ashes that might otherwise fall to the floor.

The above are features which are exclusive with the ***Great Majestic.*** No other range on earth begins to compare with it either in durability or practical serviceability. It is the best range you can buy no matter what price you pay.

Twenty years making the Majestic Range and the first still in use. The Majestic Range is for sale in nearly every county in forty states. If your dealer does not handle it, write to us and we will send you the name of dealer in your neighborhood who does. Better write anyway and get our beautiful illustrated booklet which everyone should have before buying a range.

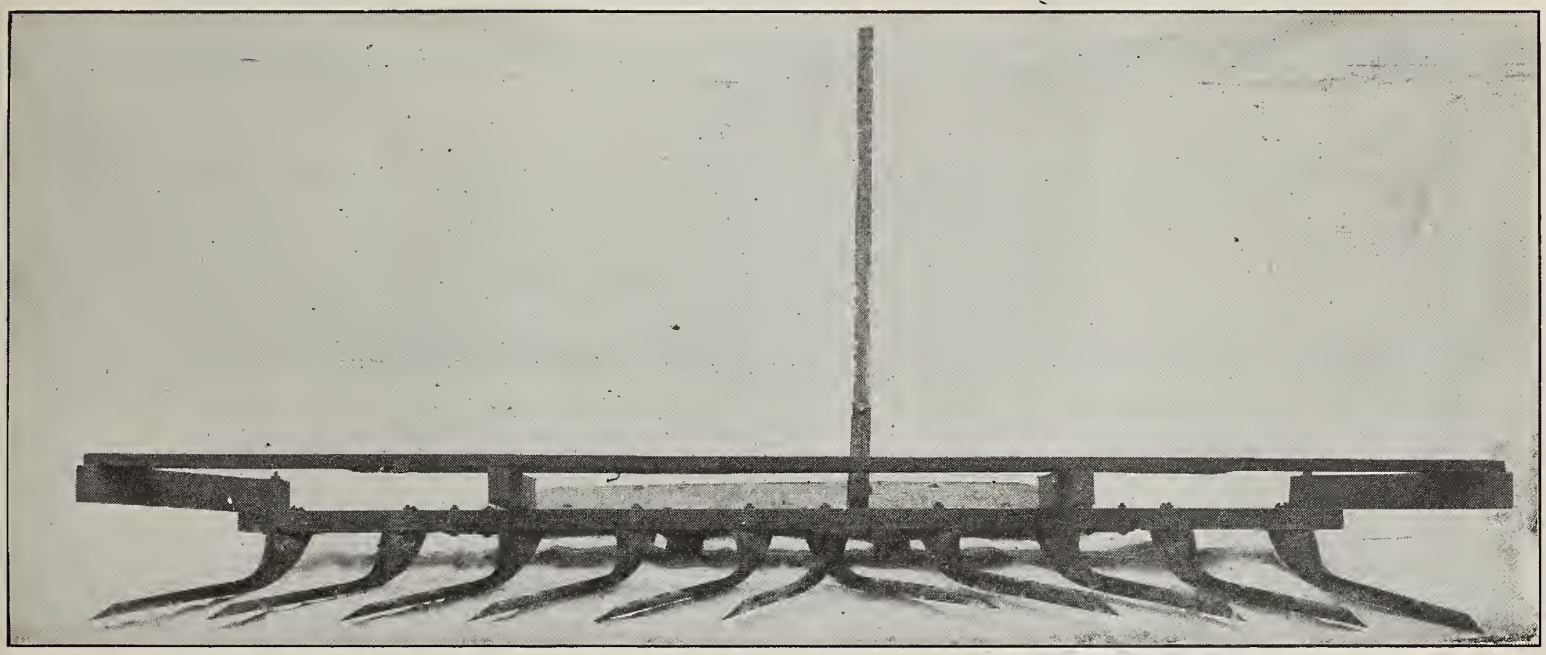
**MAJESTIC MFG. COMPANY**
**St. Louis, Mo.**

*With Water Front For Pressure Water Heating*

*With Pouch Feed and Right Hand Flush Reservoir*

# THE KIMBALL CULTIVATOR

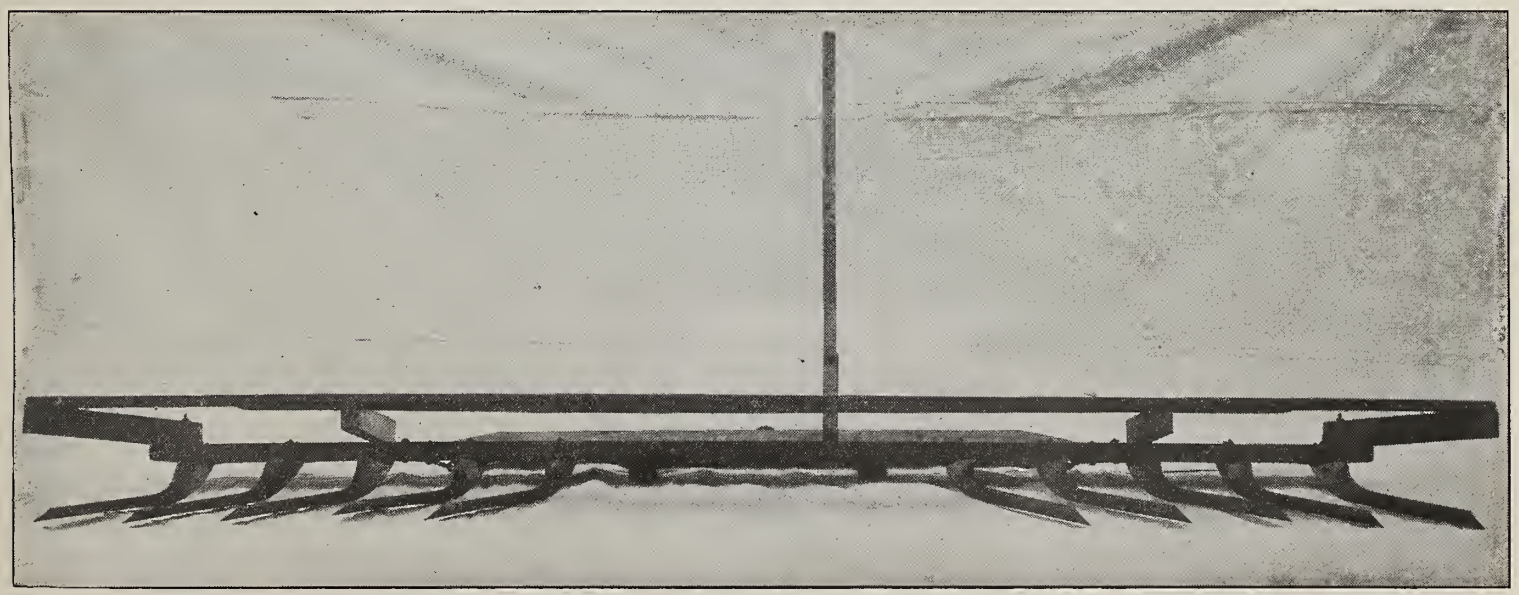
King of all orchard cultivators. Cuts below show two most desirable sizes for orchard work



This cut represents our eight and one-third foot cut which is extensively used in orchards and for working summer-fallow

*It should be borne in mind that frequent stirring of the soil is very beneficial to orchard crops as it creates a dust which prevents capillary evaporation of moisture, the retention of which in the soil is absolutely essential to the production of a profitable crop*

This cultivator will thoroughly cover one acre in one hour, thus easily performing the work of ten or twenty men. Price of the 8⅓ foot **$20**



This cut shows our twelve foot extension and is our latest and most up-to-date design specially constructed with a view to orchard work. The extension head throws blades far out to either side of center thus eliminating necessity of crowding horses under trees and avoiding all chance of abrasions by hames or other parts of harness coming into contact with limbs or trunks, or stripping lower limbs of fruit and leaves

Every up-to-date orchardist should have one of these tools. Price **$22.50**

## JOHNSTON & WEBER

*Exclusive Agents for Oregon, Washington and Idaho* THE DALLES, OREGON

# Summer Rates East

DURING THE SEASON 1909 VIA THE

## Oregon Railroad & Navigation Co.
## Oregon Short Line and Union Pacific Railroad

FROM

Portland, Seattle, Spokane, Tacoma, Walla Walla and all Points on the O. R. & N. Line

To Omaha and Return - - - $60.00
To Kansas City and Return $60.00
To St. Louis and Return - - $67.50
To Chicago and Return - - - $72.50

and to other principal cities in the East, Middle West and South at correspondingly low rates

On Sale June 2, 3; July 2, 3; August 11, 12

To Denver and Return - - - $55.00
On Sale July 1, August 11

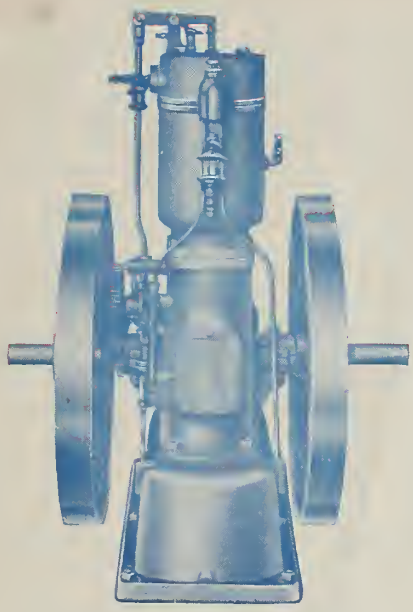
Going transit limit 10 days from date of sale, final return limit October 31st.

These tickets present some very attractive features in the way of stopover privileges, and choice of routes; thereby enabling passengers to make side trips to many interesting points enroute.

Routing on the return trip through California may be had at a slight advance over the rates quoted.

Full particulars, sleeping car reservations and tickets will be furnished by any O. R. & N. local agent, or

**Wm. McMurray,** General Passenger Agent, **Portland, Oregon**



# IRRIGATION

*provided water cannot be furnished by gravity demands two things, a good engine and a good pump—here they are*

## STOVER ENGINES—MYERS PUMPS

Are recognized as standards in their respective lines. Both are made in large plants by manufacturers who take pride in their products. Both are the results of years of practical experience and are fully guaranteed. The engine is famous for its simplicity, ease of operation and economy; the pump for its great pumping qualities and its strength of construction. Many of these outfits are in use among irrigators. Stover Engines are made in sizes ranging from two to nine horsepower in the vertical style and from five to fifty horsepower in the horizontal style. Myers Pumps are made in all sizes up to four-inch discharge, for all kinds of usage.

We also carry a full line of centrifugal pumps. Tell us what your conditions are and we will tell you what kind of an outfit would be best fitted for your use, quote you prices and send you descriptive matter.

Mitchell Lewis & Staver Co.

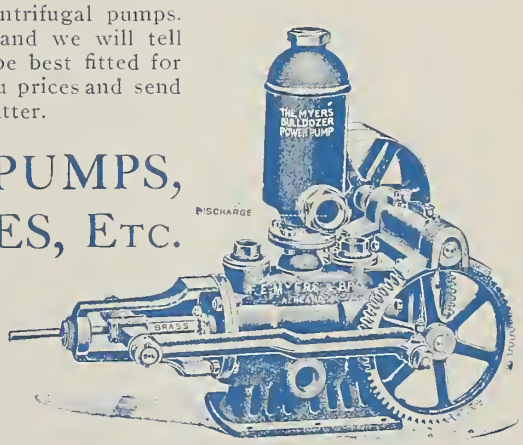
PORTLAND OREGON

SPOKANE WASHINGTON

BOISE IDAHO

SPRAY PUMPS, ENGINES, ETC.

*WRITE TODAY*





# To Oregon, Washington and Other Northwestern States Fruit Shippers

CHAPTER II.

We are presuming that you have replied to our last advertisement asking for information upon the methods of your distant customers. If you have not, will you be good enough to do so at once?

A little explanation of the system of this organization may be in order and of interest to you. Every member is reporting mistreatment by his customers. This is being investigated. Perhaps a member in Washington sends in a complaint upon a commission house in St. Louis; possibly the same mail brings a complaint from Florida upon the same house. Perhaps neither complaint would carry much weight alone, but both together will carry more. Should it be supplemented by an unfavorable report from California and another from Maine, surely all would be entitled to more consideration, and these fingers of suspicion, pointing to the same firm, would mighty near indicate that there was something wrong there. We do not refer to St. Louis except as an example to illustrate the point and explain the advantages to you, as a shipper, of being kept posted through such a system, of which this is but a very small part. This reporting information is also supplemented by the work of high-class, qualified traveling reporters and local correspondents, bankers and attorneys, railroad men, etc., etc. It is worth money to you to belong to this organization. Write us for particulars, but don't forget to tell us your experience. We want to get it into the common fund. It is worth something to have access to this fund. We believe that you would be willing to pay the price that we ask. Anyway, it is worth your consideration. Please let us hear from you. Don't forget to tell us your experiences. In the next issue we will say something more along this line.

PRODUCE REPORTER CO. *34 South Clark Street, Chicago, Illinois*

# HOOD RIVER

## *Greatest Apple Growing Valley in the World*

Where fruit pays from $500 to $1500 per acre and is marketed for you at the highest prices paid anywhere in the world, while still on the tree. Forty thousand acres of finest apple land still undeveloped. One hundred thousand horsepower going to waste in its streams. Population, 6000; value fruit products, 1907, $400,000; value lumber output, 1907, $750,000; taxable property, $2,700,000; bank deposits, 1901, $36,000; 1907, $690,494.31. Railroad and water transportation. Two hours from Portland, twelve hours from Seattle and Spokane. Rural mail delivery. Phone service covering city and valley. Let us tell you about it.

*DO IT NOW—TO-DAY*

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Publicity Committee Hood River Commercial Club

HOOD RIVER, OREGON

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